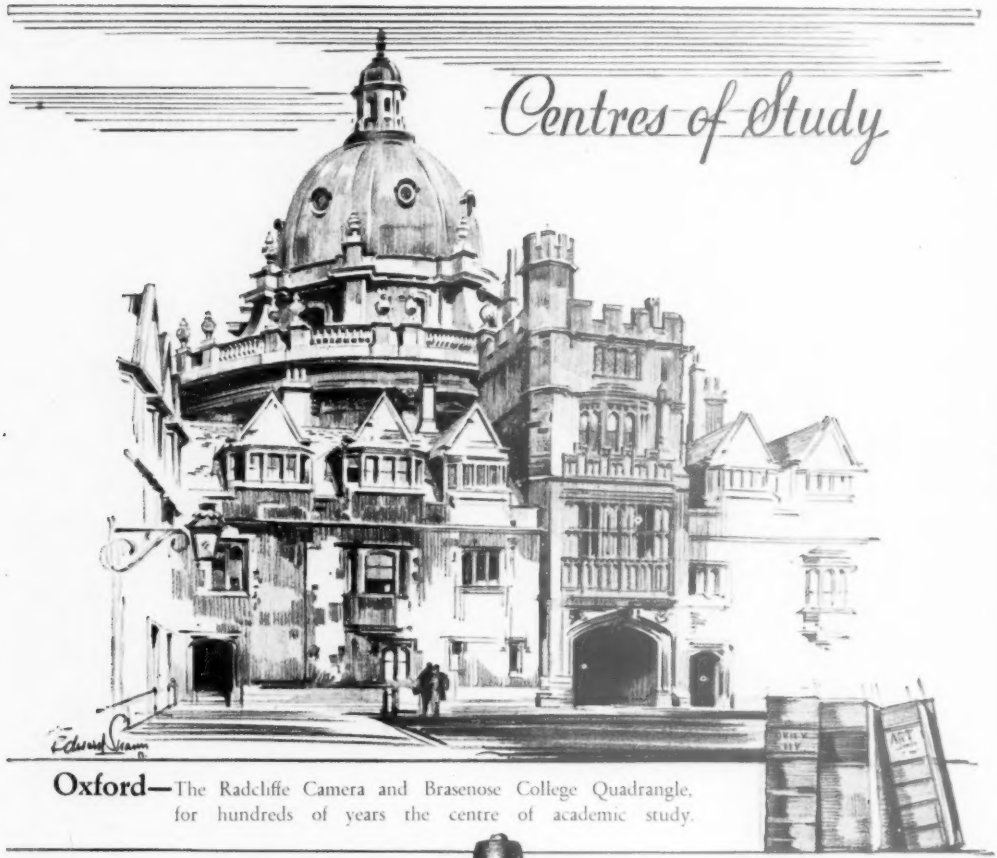
THE ARCHITECT & BUILDING NEWS

IN THIS ISSUE

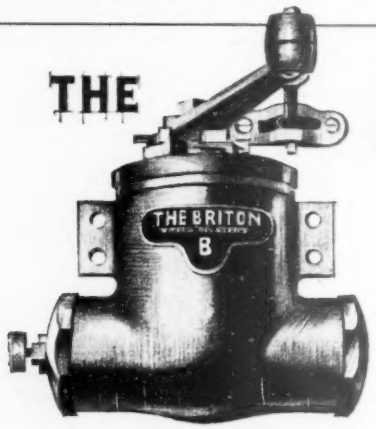
- PROPOSED BOILER HOUSE, FULHAM HOSPITAL
- NEW L.C.C. TYPE PLANS
- R.F.H.: HEATING AND VENTILATION IV

SEPTEMBER 20, 1951 · VOL. 200 · NO. 4318 · ONE SHILLING WEEKLY

Centres of Study



Oxford—The Radcliffe Camera and Brasenose College Quadrangle, for hundreds of years the centre of academic study.



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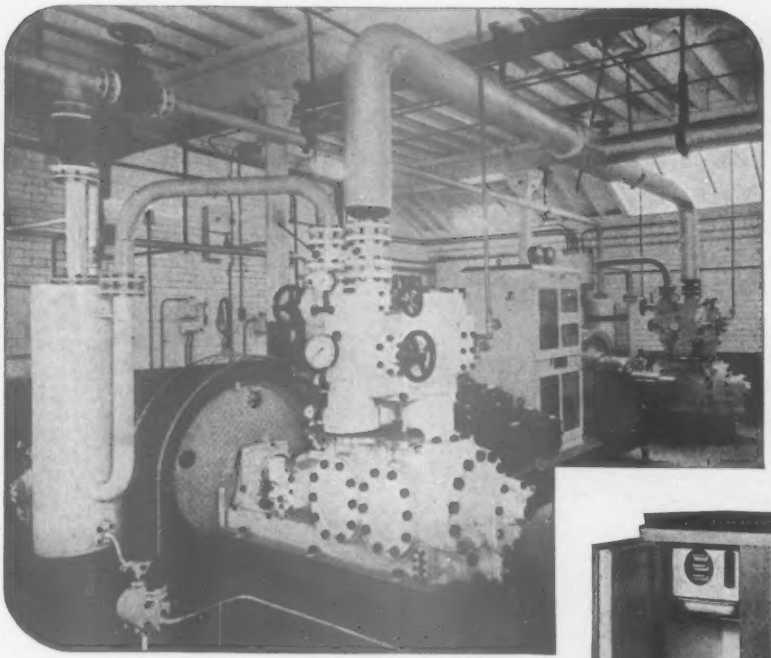

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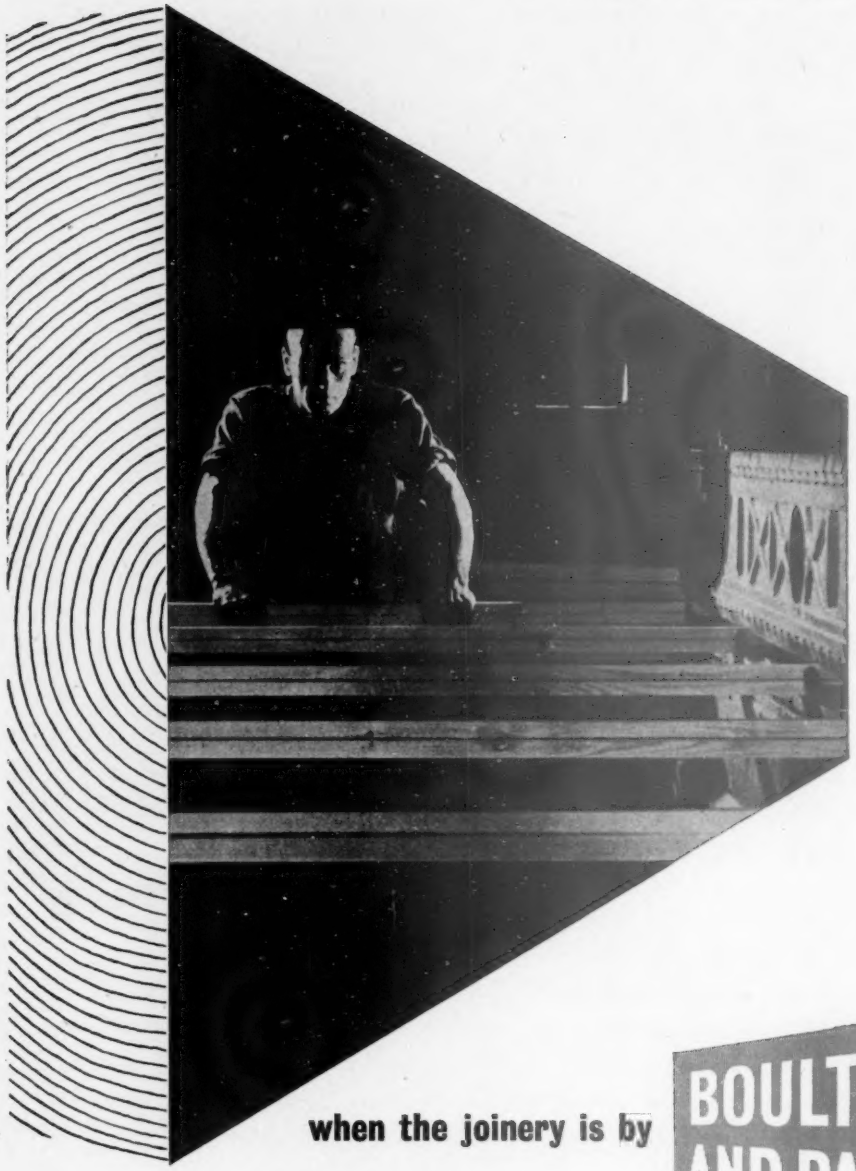

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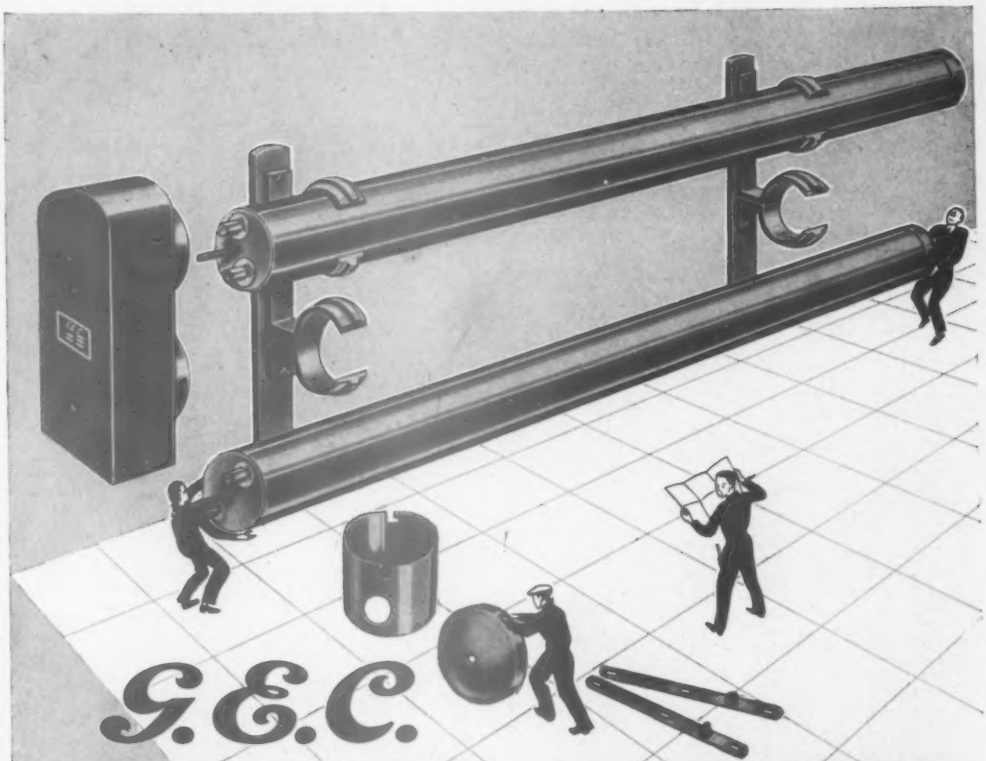

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WRITE : for Leaflet No. 1495

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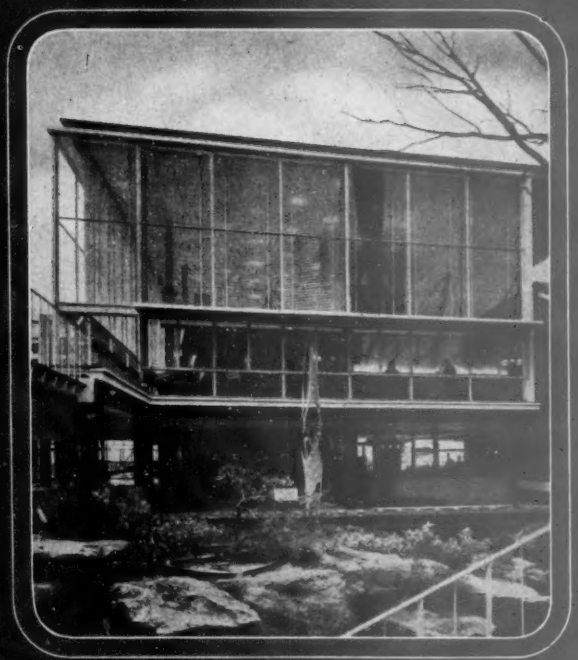

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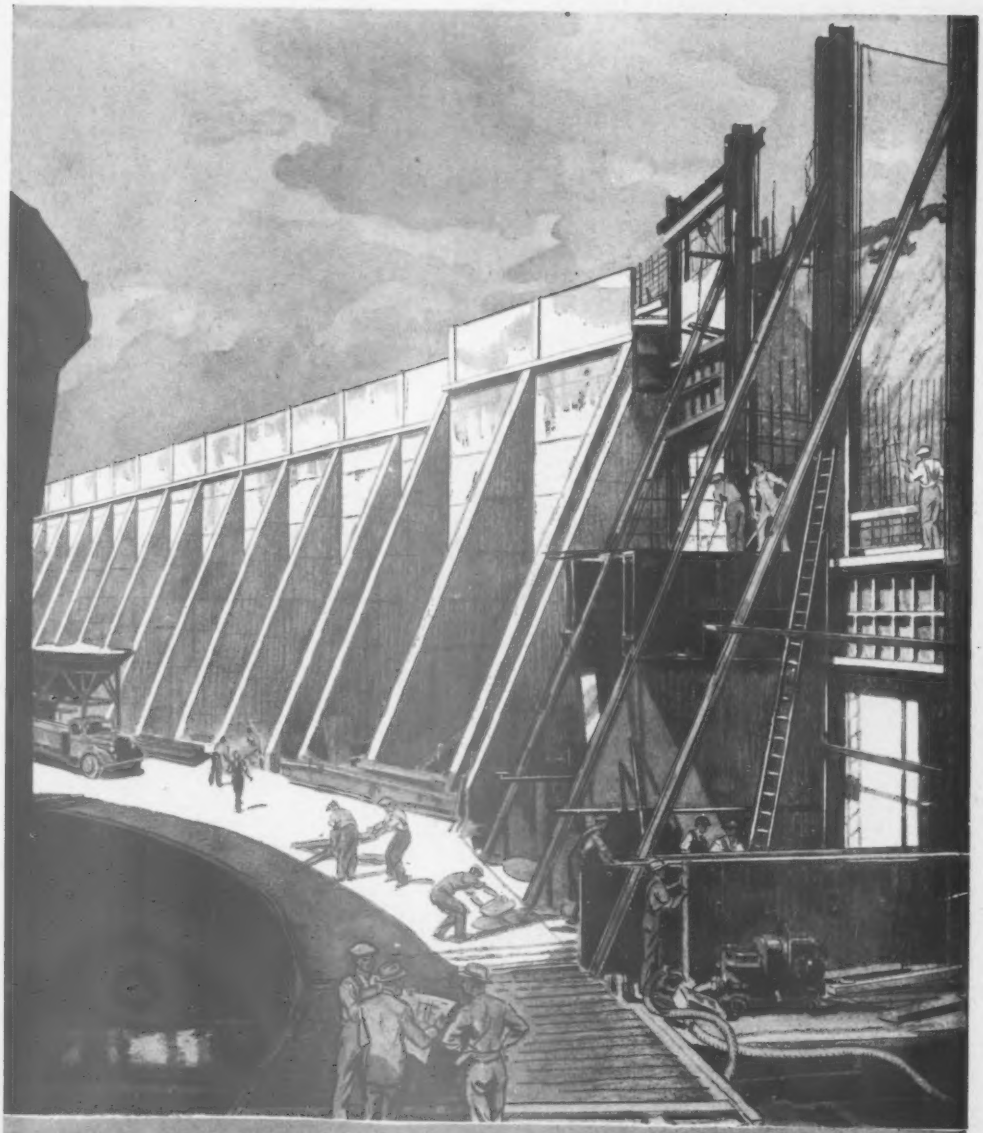

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(No. 4)

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THE BRICKLAYER

The bricklayer is a craftsman under whose eye the mortared rows of trowel-laid brick run straight and true. With his skill and his plumb line he is a builder of beauty. Soon there will rise another fine edifice, with generations of life before it . . .

AND CRAFTSMANSHIP LIVES ON *With the coming of the Industrial Revolution and the development of machinery, the era of the lone craftsman passed into history. No longer was one man single master of his trade. Instead, the work was divided among specialists, each one a craftsman in his own particular line. To-day, the individual is an expert, whose specialised skill is an essential part of the whole.*

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A6

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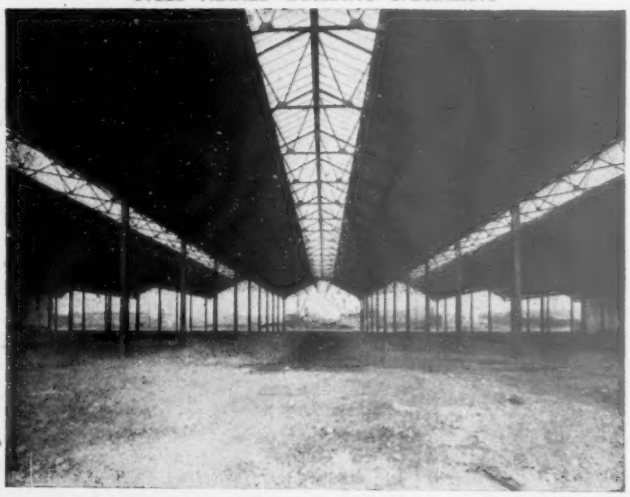

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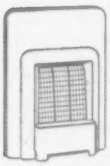

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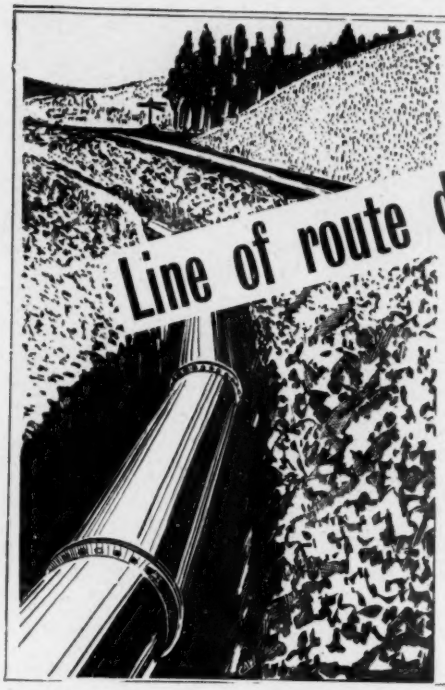

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• Water, gas and electricity installation or renewal schemes need good transport co-operation and British Railways can supply it. They convey and deliver on line of route, cables, conduit covers and pipes, besides bricks, cement and kindred commodities. Bulk deliveries of road dressing materials are made to site, including barrels, which are collected after use. Storage for contractors' tools and materials is available at central railheads. A word to your local Goods Agent will set the wheels turning.

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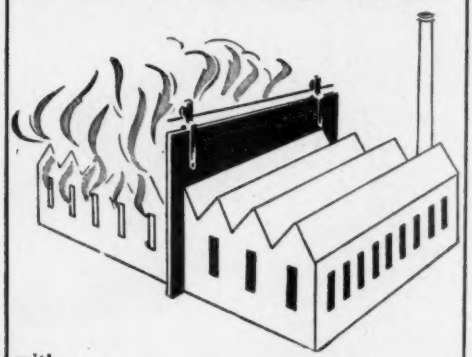

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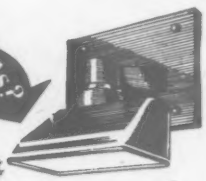

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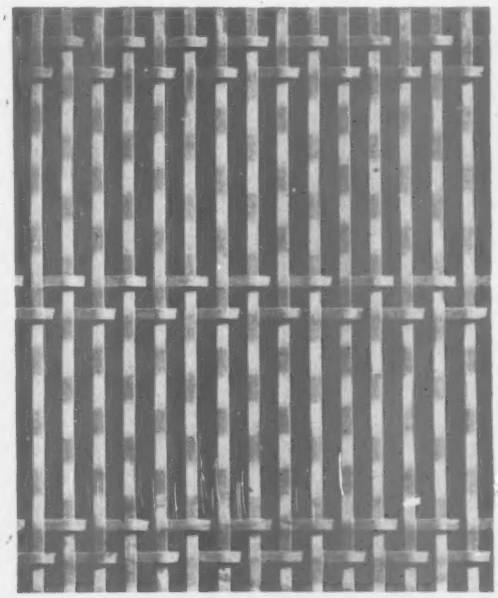

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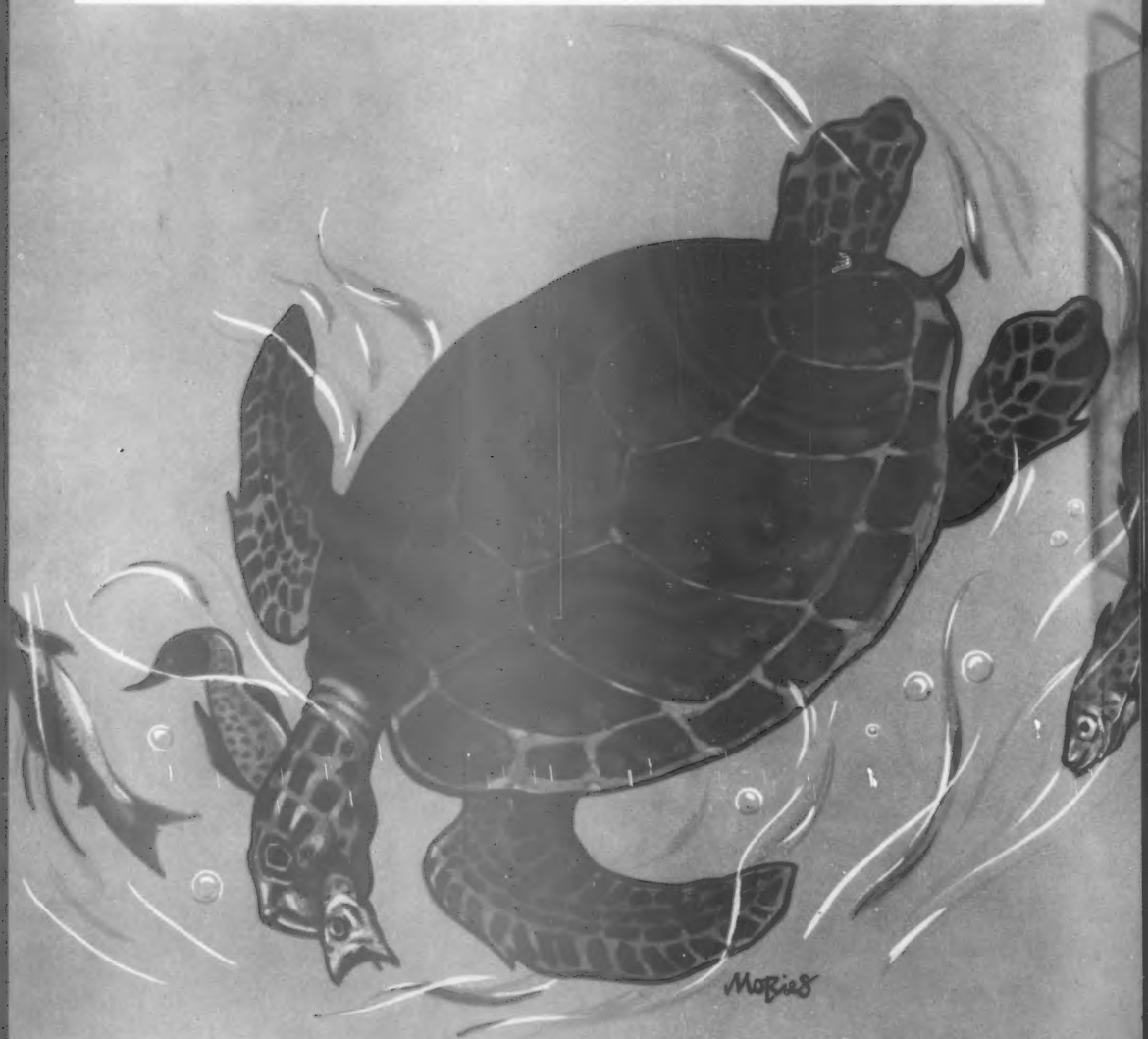

D4

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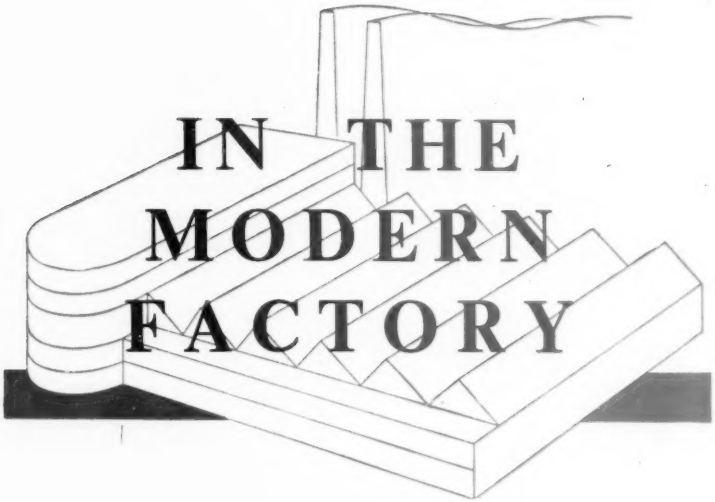
BRINGING COLOUR TO LIFE



The idea that the places where men work with machines should have grimly utilitarian interiors dies very hard indeed. A well-planned factory colour scheme is still felt to be something of a luxury. And that, of course, is just what it is not. The effective use of colour—paint applied with a purpose—is as important as good lighting and sound architectural design, of which it should be an integral part. Colour should be the worker's guide, helping him to work with greater speed, accuracy and comfort. In short, good paint means better production.

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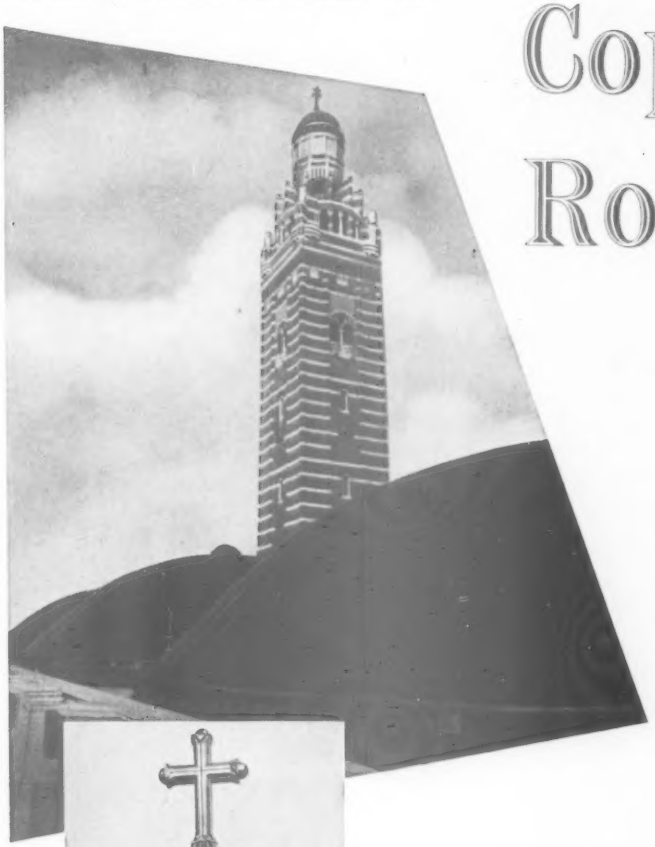

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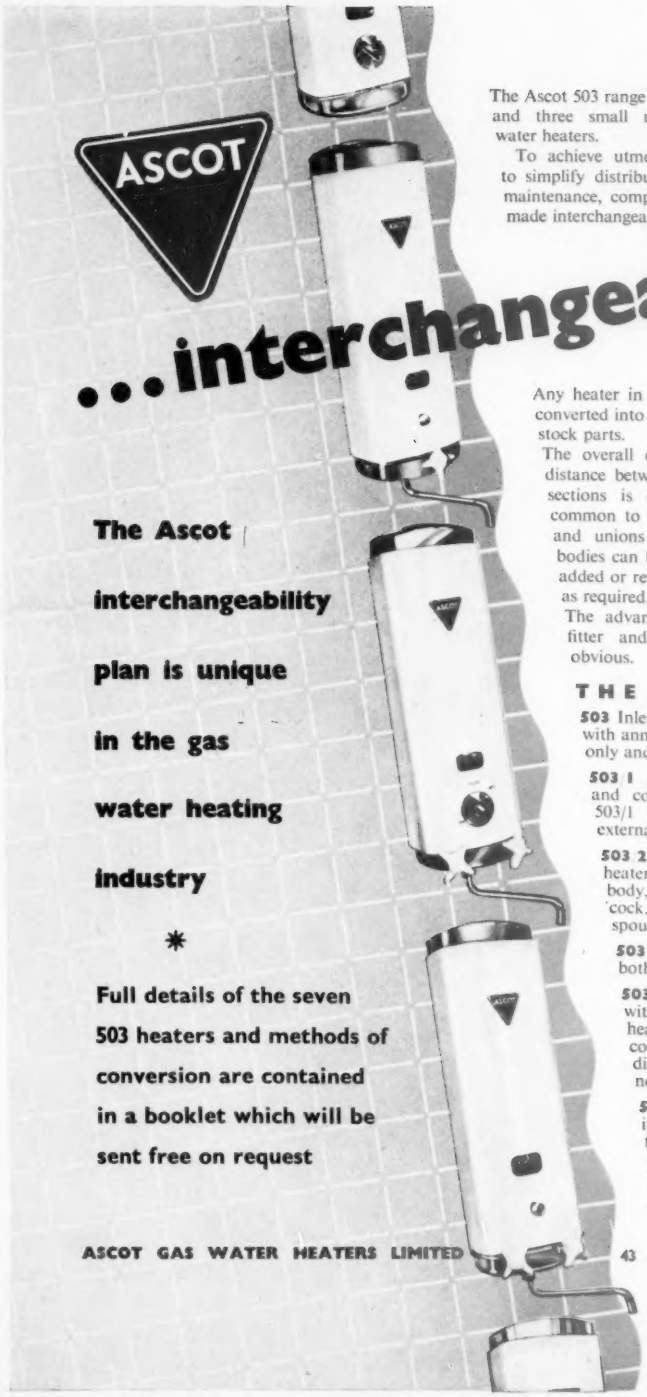

The Ascot 503 range now includes four single point and three small multipoint instantaneous gas water heaters.

To achieve utmost economy in manufacture, to simplify distributors' stocks, and to facilitate maintenance, components throughout have been made interchangeable.

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The Ascot interchangeability plan is unique in the gas water heating industry

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Full details of the seven 503 heaters and methods of conversion are contained in a booklet which will be sent free on request

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503 Inlet controlled single point heater with annular type heater body. Hot tap only and outlet spout.

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503/2 Inlet controlled single point heater with annular type heating body, built-in rotary gas control cock, hot water tap only and outlet spout.

503/3 As type 503/2, but with both hot and cold taps.

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503/5 As type 503/4, but incorporating a single hot water tap and outlet spout.

503/6 As type 503/4, but incorporating both hot and cold water taps and outlet spout.

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Vol. 200. No. 4318

THE ARCHITECT & BUILDING NEWS

September 20, 1951

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SUMMER SCHOOL

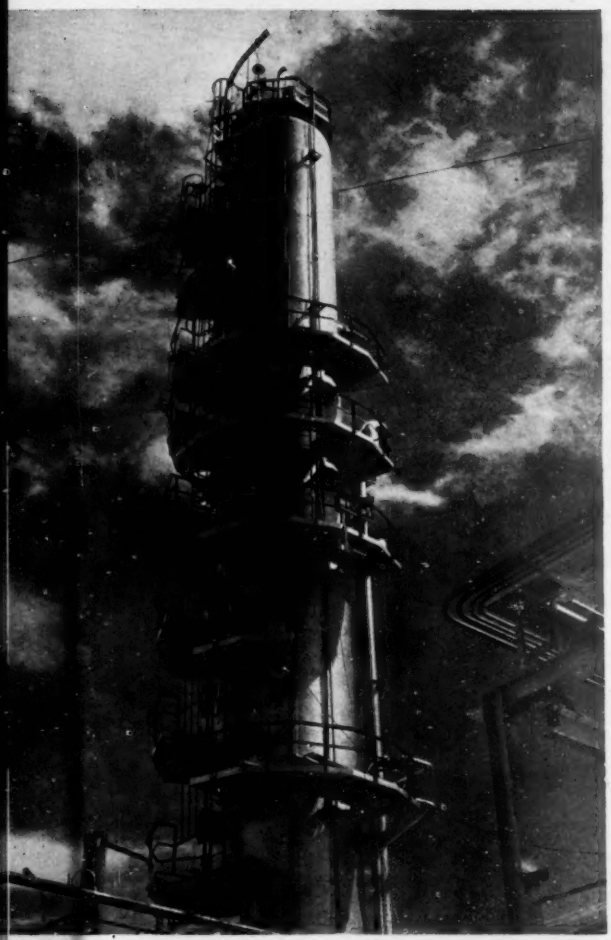
THE expenditure of human intelligence and effort in talk and writing and discussion and then in subsequent talk and criticism of previous talk, writing and discussion is just one of those prolifer-ousnesses for which untamed nature is renowned—like the 999 seeds that are wasted to produce a single plant or the millions of eggs that do not produce spoil for the fishers' nets.

The partial failure of conferences, congresses, discussion meetings, summer schools and a dozen other types of forgatherings to produce more than they do is due to the incapacity of the human brain "to take it all in"; to assemble the results (if any) into some sort of order and then, having sorted everything out, to docket the results as reference for future use or, at the least, for the avoidance of future repetitions.

Perhaps one of these days the inventive genius of man will contribute a sort of extension to the mathematical machines that now do otherwise impossible calculations for scientific investigators; something in the shape of an idea or fact-tabulating engine on the lines of those other existing machines that count and tabulate and add things up by means of holes being punched in cards—the recent census gets handled ultimately in this way. Then of course there might be some guarantee that, if and when a congress, or what have you, is organized the matter read, presented or tabled and reported, discussed or adopted could be checked against the machine to see whether it was contributive and stored against the next check in order to avoid repetitions and the risk of clogging the wheels of either the machine or human progress. Or would that spoil all the fun?

These random and somewhat irresponsible thoughts are produced because so many reports of so many "gettings-together" must pass across so many editorial tables and not because of a particular event—to wit, the annual Town and Country Planning Summer School of the Town Planning Institute which is being held this week at Oxford. An annual engagement of this sort takes on one of two characters, that of the annual "outing," aimed at a good time for all, or a serious and regularly repeated summing-up of a year's work and an opportunity for contributing to the work of the coming year. Needless to say the T. & C.P. Summer School falls easily into the second category.

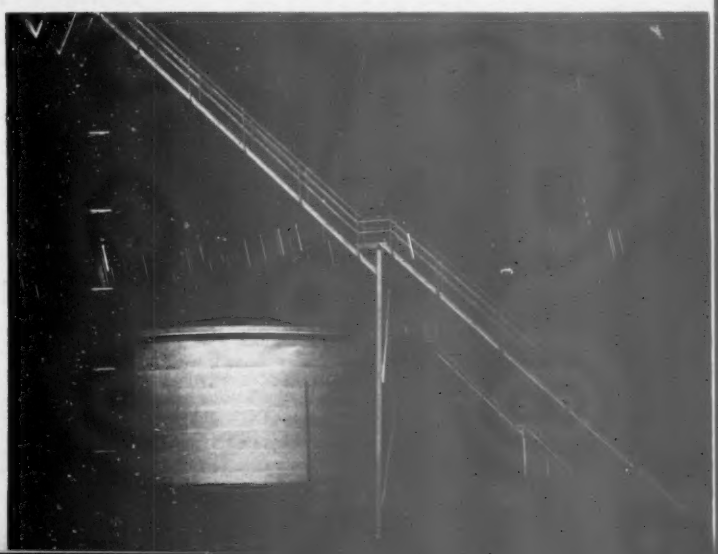
This year four main papers are being read to the School; the working of the Town & Country Planning Act comes under the review of a Surveyor—Mr. H. W. Wills. On the whole he is optimistic, while pointing out some of the snags revealed by experience. Then Mr. Anthony Minoprio reviews what has been done in the planning of towns, mainly since the war, and as an architect states or restates some of the still unsolved problems of three-dimensional planning. A paper by Mr. C. Kent Wright—who is the Town Clerk of Stoke Newington—surveys the present state of Local Government and makes a strong plea for the reform of its machinery and for the redistribution of local areas and the work allotted to them. Finally, the enlightened layman sums-up and Mr. F. J. Osborn reviews the Public Influences on Planning. So, although there are many comments, statements of problems and some criticism, this Summer School for discussion and study is this year concerned with review rather than with any startlingly new contributions—what, in fact, could be expected other than this in so short time of five days? In spite of what we have said about the real need for collating and systematizing the results of all sorts of similar regular or *ad hoc* meetings, the latter will go on and provide, presumably, just the opportunities, for those who have no other time or space, to renew enthusiasm for a subject in which they may be seriously interested either as professionals or laymen.



The 113ft Debutaniser Tower used for one of the refinery processes.

Fawley

A gleaming orderly array of tanks surround the main refinery units. Here are stored crude oil, refined oil and water.



THE ceremony last Friday of the official opening of the largest oil refinery in Europe for the Esso Petroleum Co. was as impressive as the achievement which it commemorated. Billowing white clouds scudding across the sun cast fleeting shadows over the bright array of silver cylinders, ovoids, tanks, tubes and pipes which make up the striking but not unpleasing skyline of the new refinery's 450 acres. In these surroundings some 5,000 guests, directors of Esso and Standard Oil Co., New Jersey and their wives, listened to speeches by Mr. Leonard Sinclair, chairman of Esso, Mr. Frank Abrams, chairman of Standard Oil, and the Prime Minister. Mr. Attlee, unveiling a commemoration plaque in silver, designed by Mr. G. T. Friend, declared the refinery open.

The lunch for 5,000 people which followed was staged in two marquees.

At the Press view of the refinery the day before, Mr. Luther Martin, Staff Engineer, representing the Standard Oil Development Co., gave details of the remarkable progress which has enabled the first stage of this £37½ million refinery to be completed some four months ahead of schedule. Work only began in July, 1949.

British labour built the refinery and 5,000 operatives were employed at peak construction. Some 70 expert American engineers and supervisors were called in for their specialist knowledge of refinery work. Over 6,000 blueprints were required.

A construction camp for 750 was built on the site. A school of welders was set up and men were made tolerably efficient after a 5-6 weeks' course.

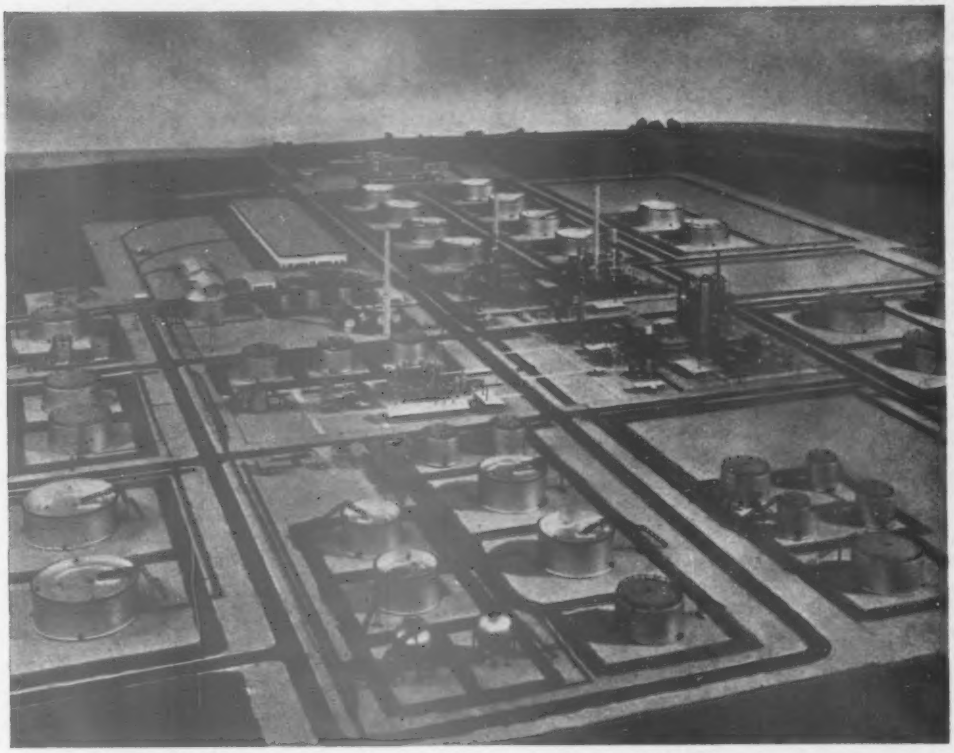
Within six months of commencement some 3½ miles of track connecting the refinery with the Fawley-Southampton line were laid and operating. A new dock with jetty 3,200 feet long has been built, capable of berthing four of the largest tankers as well as coasters.

A vast cement mixing plant was established with capacity of 140 cu. yds. of concrete per hour. This plant finally turned out 100,000 cu. yds., enough to lay a road from Maidstone to Marble Arch.

Messrs. Lanchester & Lodge, architects, were called in to design the new Administration building, cinema, canteen and laboratory blocks. These buildings will form the subject of a special article in a later issue of the A. & B.N.

In addition to this attention to technical details, amenity was not forgotten. Some 4,000 trees have already been planted merging into the countryside. Chimneys were constructed high enough to enable waste gases to be carried away clear of the countryside, and cleansing of all cooling water is attended to in the refinery's Separator Plant.

The main general contractors were Foster Wheeler, Ltd., Christiani & Nielsen, Ltd., John Laing & Son, Ltd., Wm. Neill & Son (St. Helens), Ltd., and Whessoe, Ltd.



The new Esso Refinery at a glance. A model built at Fawley by three Esso employees. Scale $\frac{1}{8\frac{1}{2}}$ inch equals 1 foot.

EVENTS AND COMMENTS

BALLOONS OVER THE SOUTH BANK

Reading one of the national dailies I noticed that some intrepid persons including Mr. H. Coxe, representing the Council of Industrial Research, had ascended in a balloon from the South Bank exhibition. I had my suspicions that the person really referred to was Mr. Anthony Hippisley Coxe of the C.O.I.D. Indeed in another paper I found his picture, a hand raised in farewell, his bow tie quivering with expectation and a doubtless false expression of jovial don't-care on his face. Few people would have guessed that he was off to Waltham Abbey in a gas balloon.

CROSSWORDS

Judging by what I see in trains there are still thousands of crossword puzzle addicts in this country. In America I believe the craze of—when was it?—is quite forgotten and its continuation here is viewed with amazement tempered with giggles. Most of the addicts are content to try and solve the puzzles but a retired Birmingham architect, possibly at a loss for a word, spotted in the layout of the *Birmingham Post* crossword No. 6,731 the plan of "an art gallery or similar type of building." In a flash he had converted the plan into a perspective sketch which he sent to the paper. The sketch was published. "I wonder" said the retired architect "if any of your readers have thought of this before?" My impression is that some architects invariably design their buildings so that if they are turned down by their clients they can use the plans for crosswords.

ABOVE AVERAGE

If we describe someone as an average sort of a chap we really mean that he is not much to write home about. We instinctively consider ourselves as something above average. After all the average height of Englishmen puts their heads very little above the table top, and we all know that we are six-footers—or nearly—and thus out of the ordinary. It is different in the army. "Grade him" says the officers' confidential report form, which gives the choice of Outstanding, Above Average, Average, and Below Average. Outstanding you are told is reserved for people with more than one field marshal's baton in their knapsacks. Above average must be used with discretion for it is considered that an Average officer should in due course make a completely

satisfactory commanding officer. This leaves only below average for summing up all those who never will be commanding officers. In civil life below average intelligence implies a moron and below average height a troglodyte. Pity then the civilian commanding officer, as like as not a militarily average person running his yardstick over an average lot of civilians in uniform. The process is a pretty average bore.

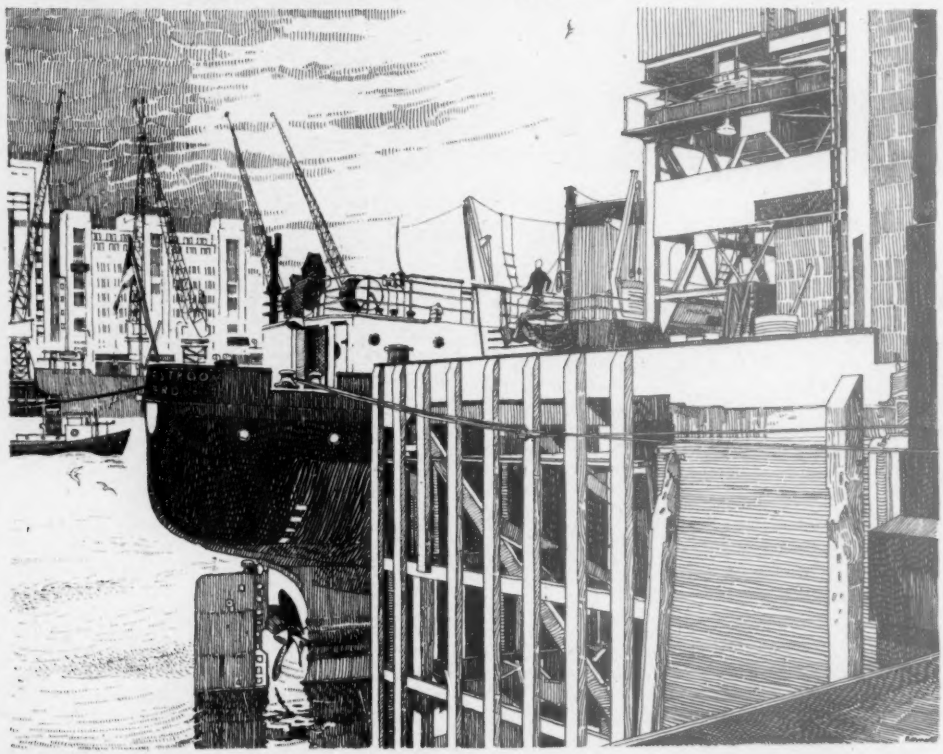
On one of our infrequent outings from camp we drove to Sandringham where the areas set aside for spectators' cars seem to rival the royal estate in size. On the way we met Queen Mary in a great green Daimler. The house is unattractive and reminded me of the Hydro at Llandudno. The grounds and their surroundings form an island of gardening sophistication in the middle of a rather ordinary piece of East Anglian country. The whole place including trees and grass has a respectful air, even the trees rustle less noisily. The cottages are almost too trim. Sandringham Church is mainly remarkable for its deceptive scale. It is built of very small pieces of stone to what appears to be three-quarters full size. The effect is of astonishing compactness and neatness. Inside there is a great deal of silverware given, we were told, by Mr. Wanamaker.

King's Lynn disappointed me. I had expected something grander. I found the customs house with some difficulty and was pleased to see that it is being restored. I had not realized that it was quite so small. Many of the surrounding houses are very interesting but the town on Saturday afternoon was not at its best.

BUILDING RESEARCH CONGRESS

My military duties have prevented my attending the Building Research Congress. I can only say I am very much relieved. An agent who attended the reception at Lancaster House on the opening day tells me that all the twelve hundred members of the congress appeared to be present and the result was that cups of tea were as scarce as the reinforcement in pre-stressed concrete. The house which, as the home of the Duke and Duchess of Sutherland in the reign of Queen Victoria, was the scene of lavish entertainment was on this warm grey day rather dingy and many people preferred to meet in the garden overlooking the Mall. This garden which is the background to many Government summer entertainments might with advantage be replanned as an example of contemporary British landscaping and planting. The house which was designed by Benjamin Wyatt was started in 1825. Smirke added a storey and Barry had something to do with its completion. The first Lord Leverhulme presented it to the nation in 1912 and it has since been used to house the London Museum—now I believe in store—and for Government hospitality.

My agent who had his camera with him found few



The Pool of London. *Pen Drawing by R. Rosner, A.R.I.B.A.*

British architects present thus proving beyond all doubt the theory that architecture is an art and not a science.

TEN DECADES

Another agent sends the following report on this interesting exhibition. He tells me that he saw three keen architectural scientists there, thus proving something else.

The exhibition called "Ten Decades. A review of British Taste" closes on September 27 so that there is not much time left if you wish to see it. The exhibition is at the R.B.A. Galleries in Suffolk Street and was jointly organized by the Arts Council and the Institute of Contemporary Arts. Personally I wish there were always an exhibition like this to go to for an odd hour. I don't care a hoot what its aim, moral, object, or purpose is for it is sufficient justification to collect and show a number of pictures that hung together form an exhibition that holds my attention.

Some pictures are the ones I liked uncritically in childhood or youth, others exemplify the combination of the skilful hand with the pin-head brain, others are pictures I have admired in reproduction and delight to see in actuality. I enjoyed both the exhibition and the catalogue which contains the result of considerable research, I should imagine, distilled to a number of quotations from art critics, pundits and artists which make very good reading in the tube on the way home from the exhibition.

A.B.S. BALL

Encouraged by the success of the Centenary Ball at the Dorchester last year the Architects Benevolent Society is going to do it again. There is no doubt that you should be there. The date is December 12, at the Dorchester, tickets two guineas each. I thoroughly enjoyed myself last time except that I found the cabaret, good though it was, too long. I believe people prefer dancing to sitting around. Write to Miss Solley for your tickets now.

ABNER

NEWS OF THE WEEK

Coventry Cathedral

Coventry Cathedral Reconstruction Committee last week unanimously approved Mr. Basil Spence's winning design. A sub-committee has been appointed to meet Mr. Spence on his return from France this week, to discuss plans for proceeding with the scheme which will probably come up for planning approval by Coventry City Council in October.

A.I.A. European Tour

A second group of members of the American Institute of Architects were entertained to lunch at the Royal Institute on September 5th. Two days previously a group of English architects had been their guests at a cocktail party at the Savoy Hotel.

This group of American architects, led by Mr. Clair W. Ditchy, the secretary of the A.I.A., are making an architectural tour of Europe, following the same route followed by a previous party in May. Some twenty-two American architects and their wives from Washington, California, Kansas, Ohio, Michigan, and many different States are travelling together to visit London, Stockholm, Zurich, Lucerne, Florence, Rome, and up across France to Paris. All along the route there will be official receptions with the architects' societies of Sweden, Switzerland, Italy and France, and visits to modern, as well as classical, buildings in each country.

In London they saw the new Pimlico flats and a modern school at Wembley, and then on to a lunch at the R.I.B.A., where English architects showed them round the building.

Their reactions? Well, amongst other things, many of them were surprised to find themselves at home among the houses and gardens of the London suburbs; they found that they much resembled their own smaller towns. In fact they felt they were visiting relatives rather than strangers. In London itself some of them had expected to see more bomb damage, and all of them thought outside plumbing and exterior pipes strangely old-fashioned. They admired the planning and design of our flats and schools, but found the finishes—such as insides of cupboards and the joinery of cheaper flats, poor to their standards. The building they admired the most—and it seems the earlier group still thought this after going all round Europe—was the R.I.B.A. building itself.

And all of them insistently regretted that the harsh conditions of our economy forbade English architects from getting to know them better by making similar visits to the States.

THE POLISH EXHIBITION AT THE I.C.A. GALLERY

Mr. B. Schlaffenberg, one of the designers of the plan for the City of London with Professor Smigielski and Mr. N. H. Gorwic, photographed with one of the models in the exhibition.

R.I.B.A. Cricket Club

The Hon. Sec. of the club, Mr. R. R. Fairbairn, reports that the R.I.B.A. Cricket Club has enjoyed a reasonably successful season, having played five matches, of which they won two and lost three.

In the case of the games lost against Blue Circle and the R.I.C.S., however, they were in both cases very close results.

The closing fixture of the season against the Club Cricket Conference was a particularly enjoyable game, and although the result looks to be an overwhelming defeat, this is not quite the case, and particular credit is due to the R.I.B.A. bowlers, who maintained a constant attack, as the Conference side scored their 201 runs in 65 overs.

The Club membership has increased but they are always happy to welcome any new members, and hope to be holding their Club Dinner at the end of the year or early 1952. Anyone interested should apply to: R. R. Fairbairn, 81, Piccadilly, W.1.

The following matches were played during the season: on 3rd June, *v.* Blue Circle C.C. on the A.A. ground, lost by 3 wickets. On 27th June, *v.* the A.A., won by 7 wickets. On 18th July *v.* The Vitruvians, won by 7 wickets. On 1st August, *v.* R.I.C.S., lost by 8 wickets, and on 23rd August, *v.* Club Cricket Conference, lost by 83 runs.

* * *

The Housing Summary for July shows that the number of permanent houses completed in Great Britain during July was 15,965, compared with 17,203 in June.

The total number of houses completed under the post-war programme is now 1,086,715 (929,569 permanent and 157,146 temporary).

Mr. Charles A. Richards, A.R.I.B.A., A.A. Dipl., has been appointed Superintending Architect to the War Office, at Chessington, Surrey. Mr. Richards will be leaving the firm of Arthur S. Ash, F.R.I.B.A., at the end of this month to take up this new appointment. During the war Mr. Richards served in the R.E.s with the rank of Lt.-Col.

COMING EVENTS

The Council of Industrial Design

Sept. 19 and 20. The 1951 Design Congress. To be held at The Royal College of Art, Imperial Institute Road, South Kensington, S.W.7.

Housing Centre

September 25, at 5.30 p.m. "The Reconstruction of Rotterdam," speakers, the Alderman and Directors of Public Works, Town Planning and Housing of the City of Rotterdam. (It is advisable to reserve seats in advance. Refreshments (2s) will be served 5.30-6 p.m.)

Exhibition

"An Adventure in Planning," an exhibition by the Civic Design Staff & Students of the School of Architecture, Polish University College, at the I.C.A. Gallery, 17-18 Dover St., 10 a.m.-6 p.m., open until October 6.

CORRECTIONS

The factory building at Bradford-on-Avon illustrated last week was for Messrs. George Spencer, Moulton & Co., Ltd., and not Messrs. George Spence, Moulton & Co., Ltd., as printed.

Grays Inn Hall: H.R.H. The Duke of Gloucester will open Grays Inn Hall on December 5, and not "Master" Churchill as was stated in last week's issue.

WILTON HOUSE

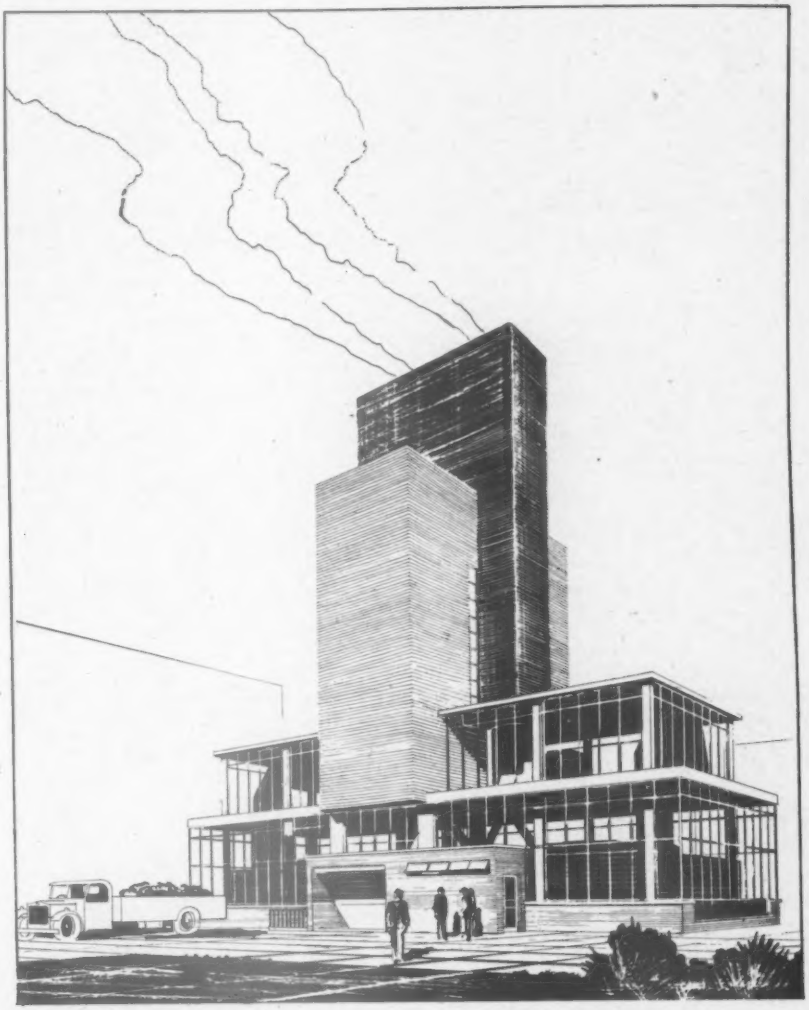
A VISIT last month to the recently opened Wilton House revealed a significant constructional point that is not brought out in the otherwise excellent guide available on the spot to what ranks without question as one of the greatest of our country houses.

For apart from the intrinsic merit and interest of the work done by Inigo Jones, Morris, Wyatt, and others there is the (literally) underlying fact that when the first Earl of Pembroke built the mid-Tudor mansion he almost certainly did so by adhering to a pre-existing quadrangular plan.

The site had long been that of an important Benedictine nunnery; the site and the buildings were given to William Herbert, later the first Earl, in 1544. He proceeded to fashion for himself the fine mansion of which only the eastern gateway survived the fire of 1647 and its resulting demolitions. It seems probable that he wholly demolished all that stood above ground of the church and of the nunnery buildings; in this he was unlike the grantee of Lacock, another Wiltshire nunnery, who re-used the cloisters and a large proportion of the other buildings so that these still survive. But what seems likely is that he did turn to good purpose the foundations of the church and claustral buildings which may well have run round the four sides of a rectangle about the same size as the present house which seems, with its quadrangular plan, to repeat the older alignment though it is the work of Inigo Jones and Webb after the devastating fire of 1647. There is nothing about it of the Italian planning one might reasonably expect from the architect of the Queen's House and Whitehall Banqueting Hall. Even if one allows for the need to incorporate the fine gateway of about 1550 it seems that the ground plan of the mediæval nunnery continued to exercise a decisive influence.

Nor, when one thinks of the nature of the site and of the building resources available in 1550 and 1647, is this wholly surprising. The site of the Abbey and of the later mansion, for all its great charm, enhanced as it has been by the efforts of two successive schools of garden designers, is not ideal from the constructional point of view. For the river Nadder, a full-flowing and at times turbulent chalk stream, flows close in front of the house which is hardly, if at all, above its flood level. The site is so low-lying, in relation to the river, that the ground must often have been waterlogged and always damp; a few miles downstream the similar conditions in Salisbury, at the confluence of the Nadder and of the larger Avon, have always been a source of anxiety, and sometimes of a flooded nave, at the cathedral. But the builders employed by the nuns must have managed to make sufficiently solid foundations to carry the considerable weight of a large church (the nunnery was one of major importance, richer than Romsey whose surviving church is of cathedral proportions) and domestic buildings to match. Such foundations, and on such a difficult site, were not to be despised, whatever the first Earl might do to the nuns' buildings themselves. So it seems that the foundations were allowed to do another job, a lasting witness to the importance of initial operations. If this conjecture is right, and if the plan of the nunnery was the usual one, with the monastic buildings south of the church, then the double cube room is over the site of the nuns' dining hall and one is ushered out of the house over the site of the church's nave.

B. L.



New Boiler House, FULHAM HOSPITAL

architects: JOHNSON & CRABTREE, FF.R.I.B.A.

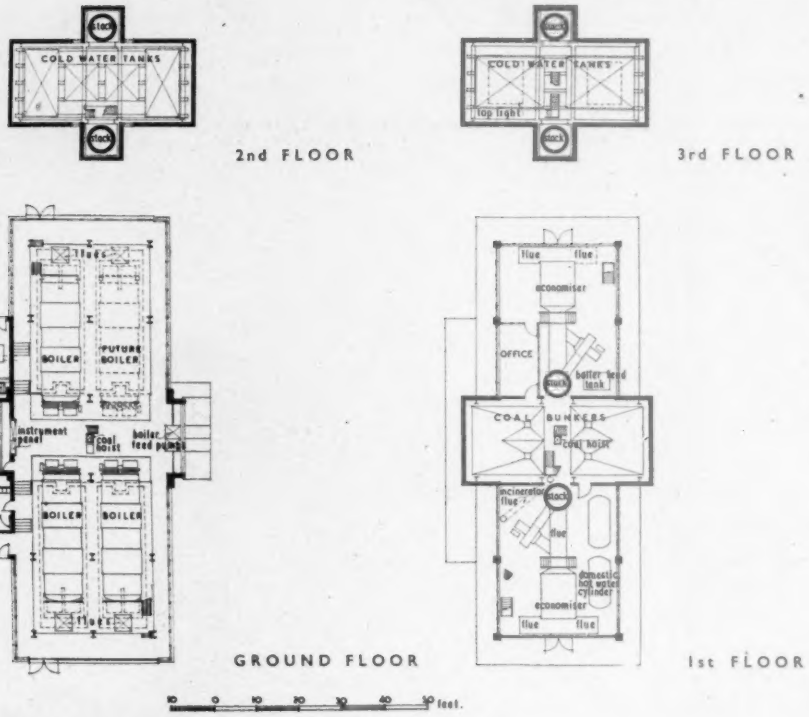
THE new boiler house has been designed to occupy as little ground space as possible; a requirement necessitated by the present hospital buildings and also by the development plan prepared by Ronald Ward & Partners, F.R.I.B.A., Consultants to the Regional Hospital Board, which envisages a very full use of the site.

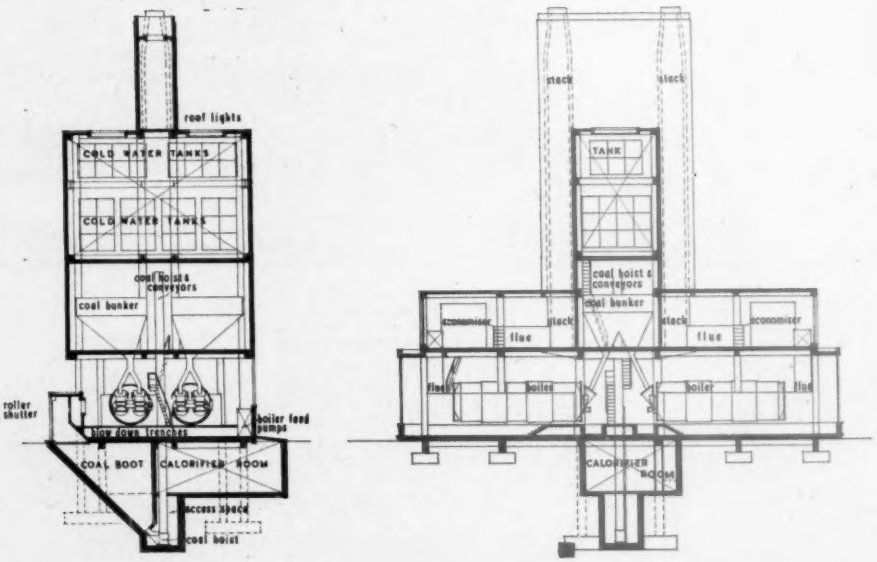
Three Lancashire boilers will be installed to begin with and a fourth will be added later when development of the hospital may warrant it. One of the main advantages of the arrangement of the boilers in pairs to an economizer unit and chimney, is that each side can be used independently and repairs, replacements and cleanings can be made by putting one side only out of action.

The water tanks in the chimney tower are not necessarily part of the boiler house but are designed with it to facilitate the rebuilding of the hospital.

The structure is to be of steel with light panel walls of brickwork bonded with 6in cellular terra-cotta blocks. The windows are to be of standard industrial sections. The floors are to be of reinforced concrete and checker plate.

Phillip Son & Norfolk are the Consulting Engineers. S. F. Draper, Engineer-in-Charge. Engineer to the Hospital Board, S. C. Vincent, B.Sc., M.I.M.E., M.I.E.E. Consultants to the Regional Hospital Board, Ronald Ward & Partners, F.R.I.B.A. Architect-in-Charge, K. H. B. Tandy, B.Arch.(Sydney), A.R.I.B.A.





NEW BOILER HOUSE, FULHAM HOSPITAL

L.C.C. HOUSING

new type plans for balcony and staircase access flats

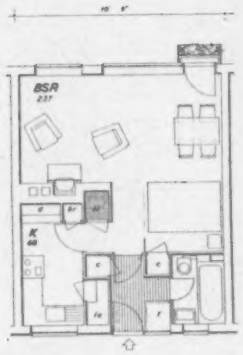
THE London County Council have recently approved new type plans for balcony and staircase access flats. The designs have been prepared by the Development Group of the Housing Division in the department of the Architect to the Council, Mr. Robert H. Matthew, A.R.I.B.A.; Principal Housing Architect, Mr. Whitfield Lewis, A.R.I.B.A.

The London County Council's long-term housing problem calls for a great variety of dwelling types in order to meet in a balanced way the varying requirements of the population, and with this object and with the idea of further improving amenities, type plans have been reviewed in the light of post-war building experience and contemporary trends in planning and design. The new "point" flats and superimposed maisonettes introduced on the scheme for Princes Way and Wimbledon Park Site, Wandsworth, have been published previously and, in addition, one new type of balcony access and three new types of staircase access flats, all for use in three- and five-storey blocks, have now been approved. These are designated BA/B, SA/A, SA/B and SA/C, respectively, and are described in detail below.

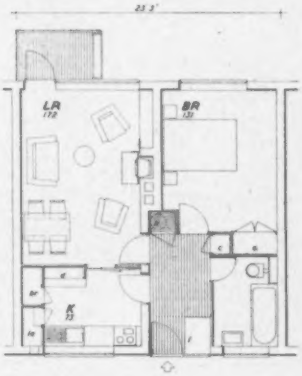
As the bedroom accommodation in existing types of flats is considered adequate, the main object in the new types is, by careful planning and economy of construction, to increase the living areas without reducing the bedroom space.

A general policy has been established of planning the smaller flats in balcony access, and the larger flats in staircase access blocks. This makes it possible to ensure that in the former, no bedrooms overlook the access balcony, and in the latter, that the advantage of having two unobstructed external walls can be fully exploited in the planning of the larger flats. There are also obvious economic advantages in this sub-division of accommodation in that the inherent higher cost of staircase access can be borne more readily by the larger units. It should also be emphasized that, in all types, frontages have been kept to a minimum in the interests of (i) more open site layouts, and (ii) economy in access roads and services.

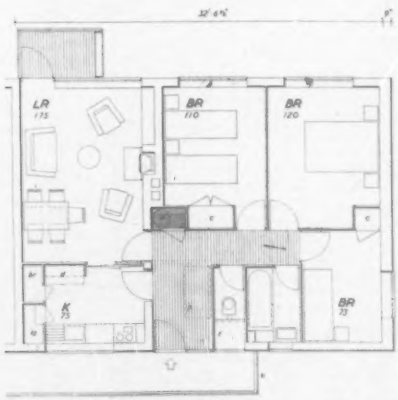
In the staircase access types, three alternative arrangements of the living space are provided: (i) large living-room



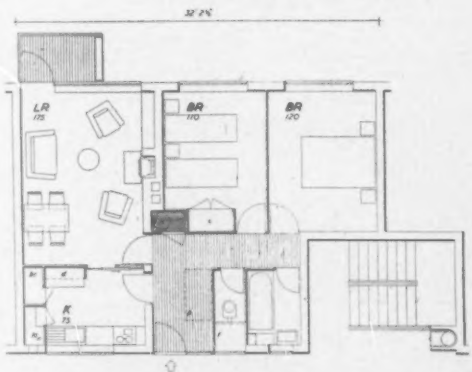
B.A. B.1. 1-room flat. Overall area: 407 sq. ft.



B.A. B.2. 2-room flat. Overall area: 509 sq ft.



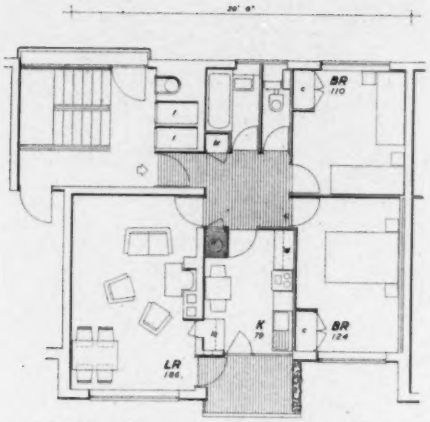
B.A. B.4. 4-room flat. Overall area: 719 sq ft.



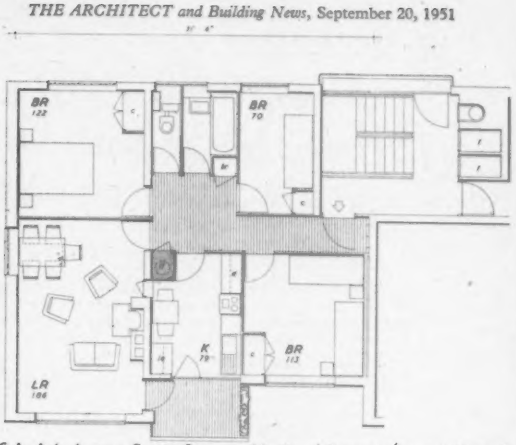
B.A. B.3. 3-room flat. Overall area: 642 sq ft.

BALCONY ACCESS TYPE PLANS IN 3- AND 5-STOREY BLOCKS

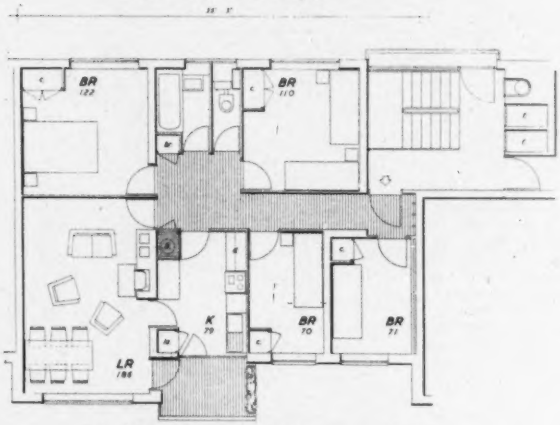
G



S.A. A.3. 3-room flat in 3-storey blocks.
Overall area : 645 sq ft.

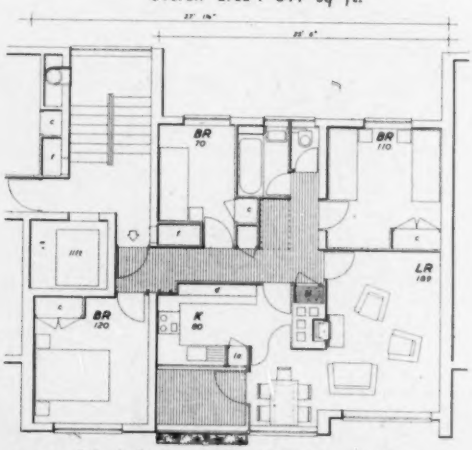


S.A. A.4. 4-room flat in 3-storey blocks. Overall area : 750 sq ft.



S.A. A.5. 5-room flat in 3-storey blocks.
Overall area : 844 sq ft.

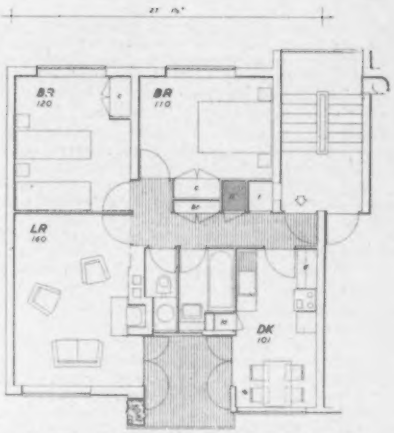
S.A. A.3L. 3-room flat in 5-storey blocks.
Overall area : 656 sq ft.



S.A. A.4L. 4-room flat in 5-storey blocks.
Overall area : 745 sq ft.

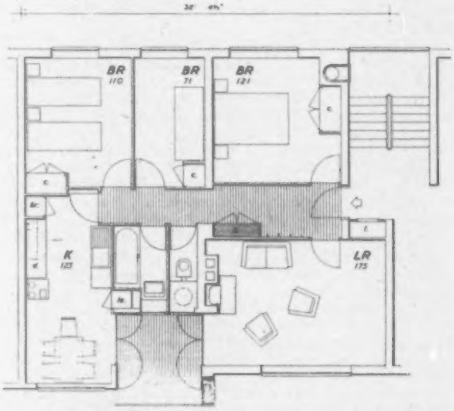
S.A. A.5L. Dining Kitchen 5-room flat in 5-storey blocks.
Overall area : 877 sq ft.

S.A. B.4. Through Living Room. 4-room flat in 3-storey blocks. Overall area : 777 sq ft.



S.A. C.3. Dining Kitchen. 3-room flat in 3-storey blocks. Overall area : 640 sq ft.

S.A. B.4L. Through Living Room. 4-room flat in 5-storey blocks. Overall area : 776 sq ft.



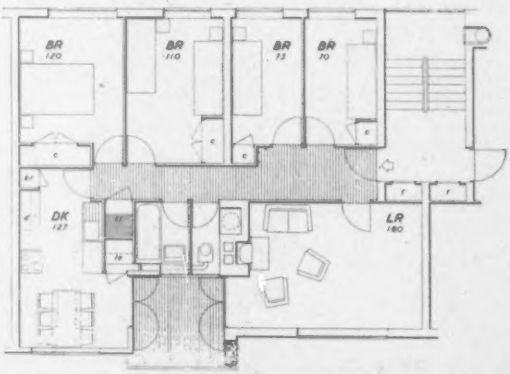
S.A. C.4. Dining Kitchen. 4-room flat in 3-storey blocks. Overall area : 777 sq ft.

with working-kitchen planned for occasional meals (ii) large living-room with dining recess adjacent to working-kitchen (iii) smaller living-room with larger dining-kitchen, both opening on to a private balcony. There is also an experimental "through" living-room type which has been approved for limited use in appropriate cases. The various types are described in greater detail below.

Balcony Access Type BA/B.—These flats contain from one to four rooms, the four-room units being used at ends of blocks only to obviate bedrooms overlooking the access balcony. They have a compact working-kitchen with separate access from the hall and, to facilitate the serving of meals and to permit the supervision of children in the living-room or on the balcony, a sliding door is provided between the kitchen and living-room.

Staircase Access Type SA/A.—A flat with a working-kitchen and eating space in the living-room. While it is expected that all main meals will be served in the living-room, there is room in some of the kitchens for occasional meals. The flats range from three to five rooms. The

STAIRCASE ACCESS TYPE PLANS



S.A. C.5. Dining Kitchen. 5-room flat in 3-storey blocks. Overall area : 875 sq ft.

kitchens have access to the private balcony, thus enabling children on the balcony to be seen from the kitchen. The balcony can be used as an extension to the living-room and in summer, meals can be taken on the balcony if desired. The five-room flats of this type have a dining recess in the living-room within easy reach of the kitchen.

Staircase Access Type SA/B.—This four-room flat is designed to provide a more open arrangement in the living areas. There will be a small lobby at the entrance door. The living and dining areas form a continuous room from front to back of the block, giving a double outlook which is particularly suitable on certain sites, e.g., where the view would otherwise be to the north. The bedrooms and bathrooms are entered from a separate lobby beyond the living room, thus providing greater privacy and quietness for these rooms than is afforded by the conventional arrangement.

Staircase Access Type SA/C.—These flats have from three to five rooms and there is space in the kitchen for meals, so leaving the living-room free for other purposes. To provide this eating space in the kitchen, the kitchen fittings and equipment are concentrated at the rear end of the room. This arrangement has the advantage of providing a very useful space for ironing and other household jobs and a space where children can do their homework. In the larger flats, the larger size of the kitchen makes it virtually a second living-room. Both the dining- and living-rooms have double glazed doors opening to the private balcony, which in summer would serve as an extension of the living space of the flat.

There is space for a pram in all flats served by lifts. Each type has been designed to permit a high degree of flexibility in the arrangement of units, so that blocks incorporating different kinds of accommodation can be built up without alteration to the basic type plans. The choice of the types of flats to be constructed will depend on site conditions, the kind of accommodation required and other factors. It is not intended that the types will be rigidly adhered to, but rather that they establish certain principles of planning, space and cost standards, capable of flexible and varied application in relation to site considerations.

The system of construction in all the new types comprises load-bearing "cross-walls" in brickwork with continuous solid R.C. floor slabs spanning between. External walls, being merely panels, can be in various forms of light cavity construction, providing a high degree of thermal insulation with considerable freedom in elevational treatment. It has been found that, in general, this method of construction leads to economies in comparison with the conventional load-bearing external and spine wall system normally employed on housing. This is due to the reduction in foundations, which are only necessary under the cross-wall, panel walls being carried on the floor slabs.

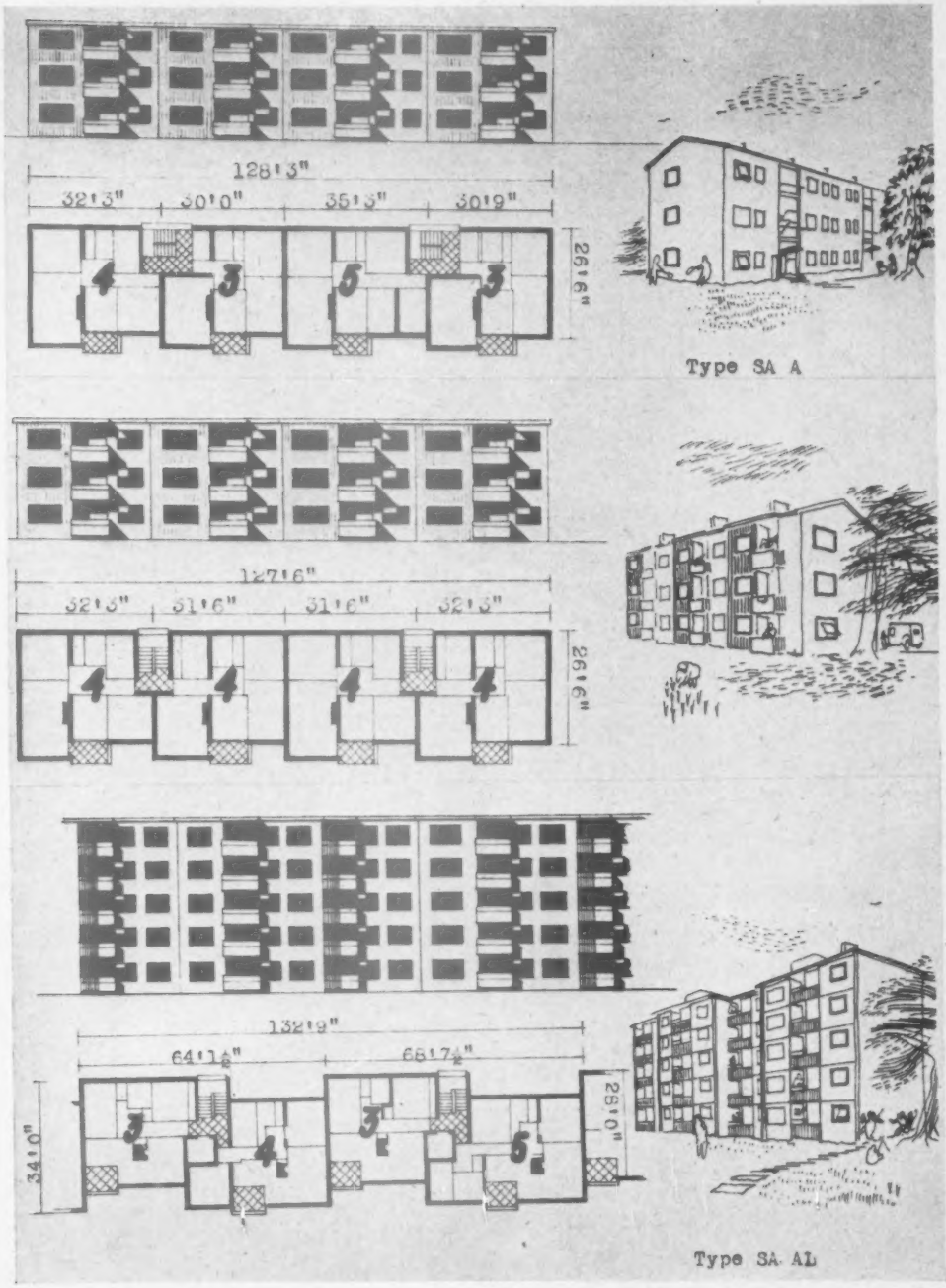
The new types of flats will provide, with some reduction of overall cost, improvements in the space planning of the living areas and variety of accommodation arrangement and architectural treatment. The reduction of cost is estimated to be from £4 to £40 a room and up to £195 a flat.

S.A. C.3L. Dining Kitchen. 3-room flat in 5-storey blocks. Overall area : 650 sq ft.

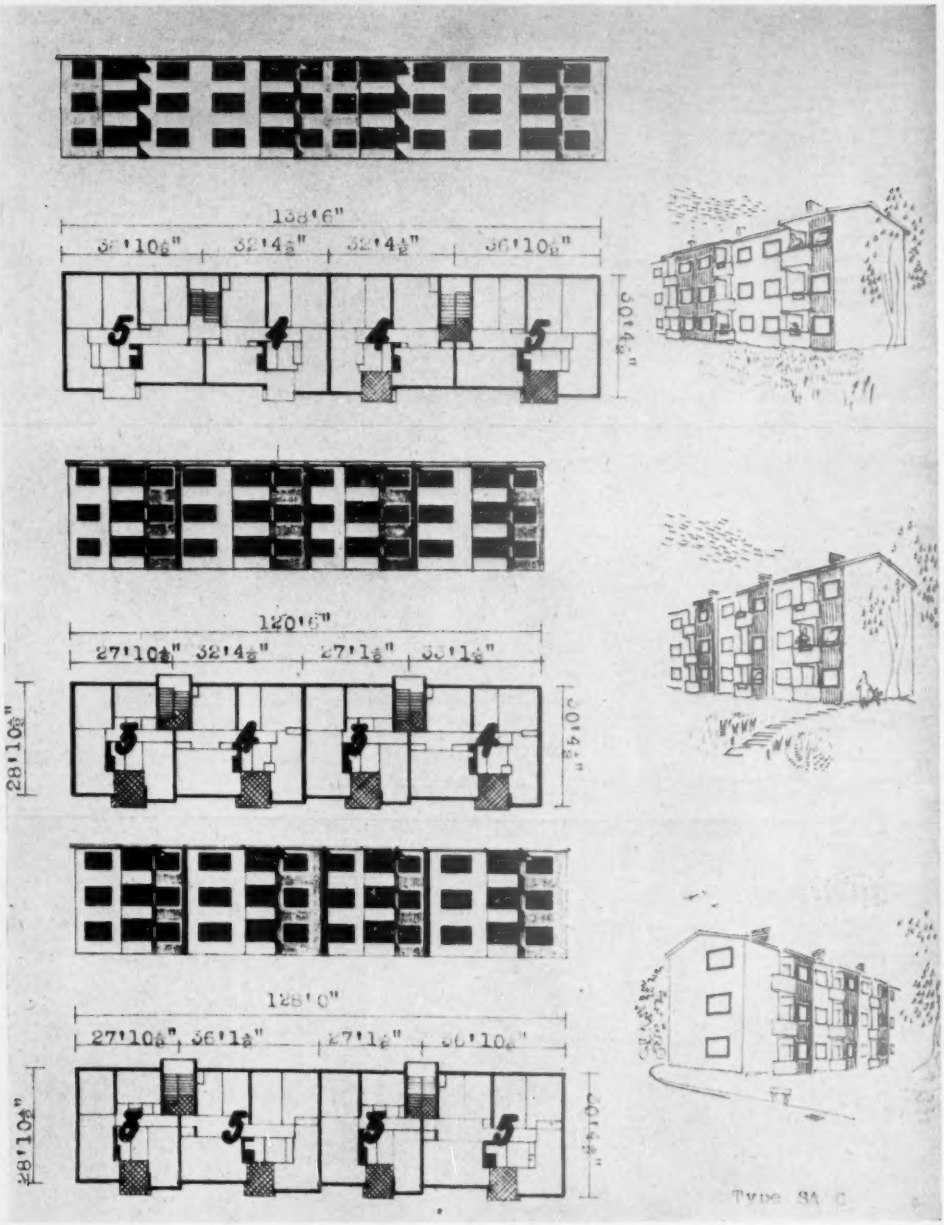
S.A. C.4L. Dining Kitchen. 4-room flat in 5-storey blocks. Overall area : 774 sq ft.

STAIRCASE ACCESS TYPE PLANS

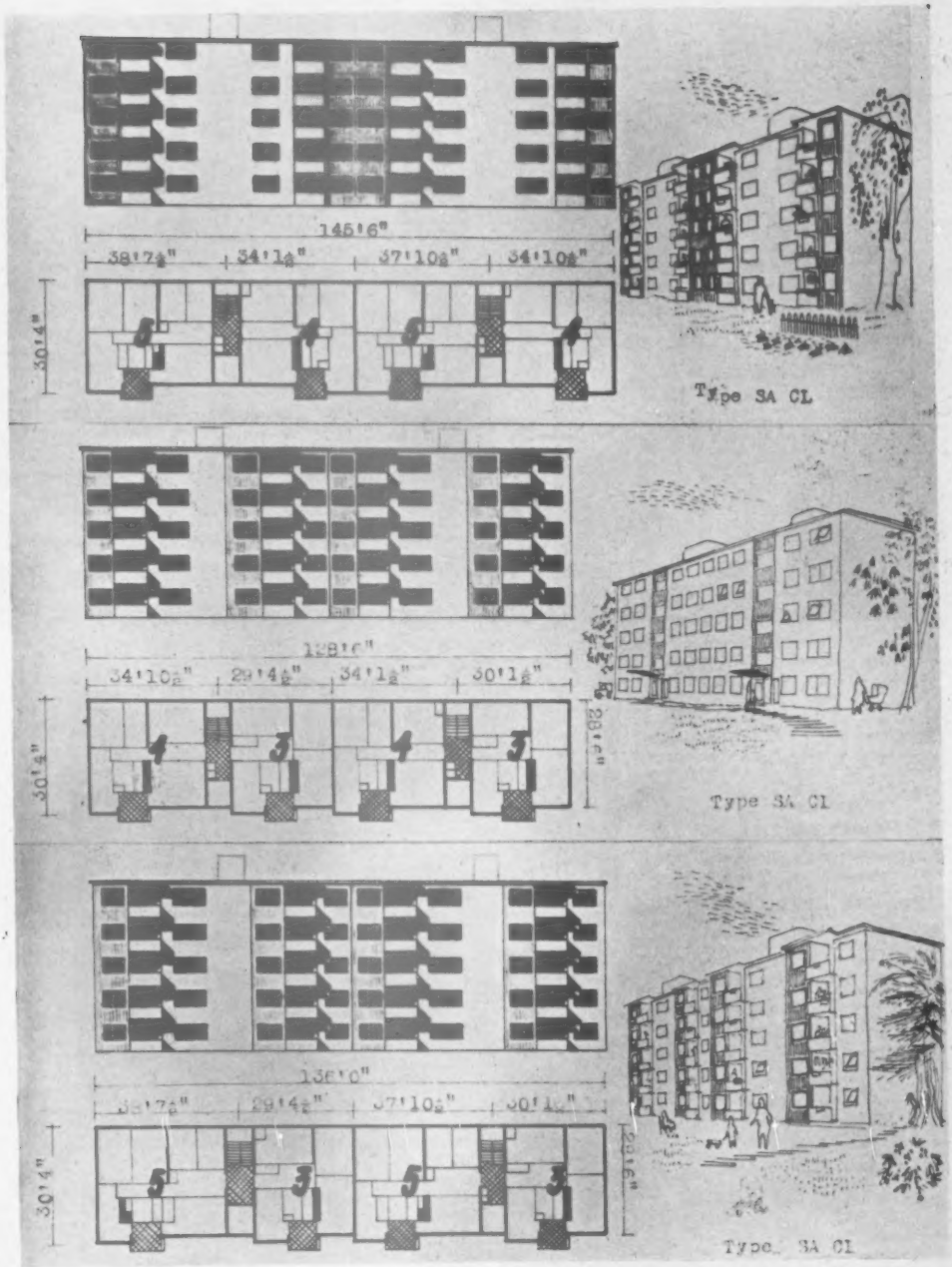
S.A. C.5L. Dining Kitchen. 5-room flat in 5-storey blocks. Overall area : 878 sq ft.



L.C.C. type plans and their application



L.C.C. type plans and their application SA C & SA CL


145'6"
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Type 3A CL
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Type 3A CI
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37'10½"
30'4"
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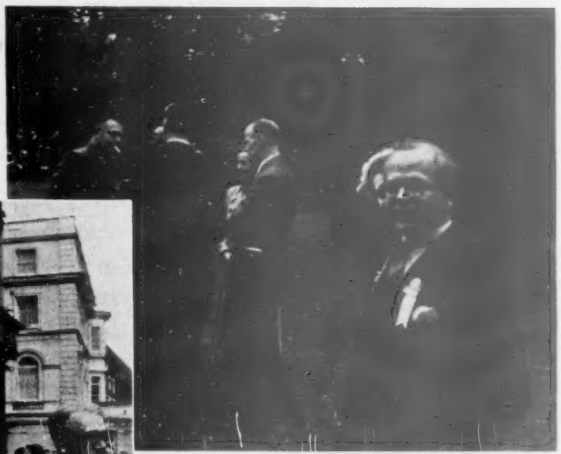
28'6"
Type 3A CI

Above : Mr. Alister McDonald, Hon. Organising Secretary of the Congress, and Mrs. McDonald. Right : an L.M.B.A. group including Mr. David Woodbine-Parish, Mr. G. H. A. Hughes and Mr. H. E. Yeomans.

BUILDING RESEARCH CONGRESS

Reception at Lancaster House



Above : Mr. Edwin Williams, Left : a contingent of Architects from Northern Ireland including Mr. R. L. Williams, Hospitals Authority; Mr. H. F. Harris, Chief Engineer; Mr. James Aitken, Chief Architect Ministry of Health and Mr. R. S. Wilshere, Education Architect for Belfast.

BUILDING RESEARCH TO-DAY

Address by Dr. F. M. LEA, O.B.E., D.Sc., F.R.I.C.S., Hon.A.R.I.B.A., Director of Building Research, D.S.I.R., given at the opening session of the BUILDING RESEARCH CONGRESS, at the Institution of Civil Engineers on 11th September

Building Research Congress: Dr. Lea talking to Lord Morrison and Sir Charles Mole at the Government Reception at Lancaster House.

ORGANIZED building research is a product of the present age, but the spirit of curiosity that underlies all research, together with an ability to profit from chance observation, must reach far back into the efforts of primitive man to obtain shelter from the elements. Lime, or plaster, arose from the observation of the effects of fire on the appropriate raw materials, and that the pursuit of these happy accidents was as fruitful as the flavour of roast pig proved delicious to the young firebrand whose exploits Lamb relates in his Dissertation on Roast Pig. Similarly, the development of a form of construction such as the arch—known at least 6,000 years ago—or the dome, was doubtless the result of observation of natural forms, of much ingenuity, and of numerous trials and failure. Such indeed is the procedure that building was to follow for long ages.

The writings of Vitruvius, a contemporary of Julius Cæsar, though of little note as literature, rank high in the early recorded history of building. The detailed information on the preparation of materials and methods of construction that we find in his *De Architectura* was the fruit of many centuries of experience, practical trial and observation. On some subjects, as, for example, lime and mortar, little that was new was added for nearly 1,800 years.

An active direction of the scientific method of experimental enquiry to problems of building first becomes evident in the 18th Century. It was, for instance, in the middle of that Century that John Smeaton, a mathematical-instrument maker, who was selected as the builder of the Eddystone Lighthouse, commenced investigations on hydraulic limes, and towards its close that the physicist Benjamin Thompson, Count Rumford, conducted his researches into the heating and lighting of buildings and made a munificent endowment to the Royal Society "to encourage such practical improvements in the generation and management of heat and light as to tend directly and powerfully to increase the enjoyments and comforts of life, especially in the lower and more numerous classes of society." Among other subjects Rumford studied the cause and cure of smoky chimneys.

The first systematic series of tests on the strength of materials of construction was made by P. van Musschenbrook at Leiden and published in 1729, to be followed later by tests in France on structural timber and stone. The testing machine of Rondelet, installed at the Ecole des Ponts et Chaussées about 1780, was the first of appreciable size. Its capacity was 18 tons. The development of the theory of elasticity at the turn of the Century was to provide the basis for the later developments in structural mechanics.

In the 19th Century we find the systematic testing of materials and structural members growing apace and the early beginnings of scientific research into their manufacture, behaviour and use. The revolution in building that had commenced with the introduction of cast iron as a material for columns and beams at the end of the 18th Century was hastened by the coming of steel, of modern cements, of reinforced concrete and other materials and by the progressive application of the theory of elasticity to design. The problems arising from the lighting and heating of buildings took shape, the physical knowledge of sound began to find application in design, and the recognition of the influence of building construction and sanitation on health had its outcome in building regulations.

The growth of building research as an organized entity has been stimulated by the growing complexity of modern materials and methods and by the increasingly rigorous demands of the user. Laboratories for testing materials, and for research in allied problems, were established in the last Century, but apart from these the major contribution long remained that of the individual worker in the University or elsewhere. It was only in 1920 that the Building Research Station was set up in Great Britain and this I think I can justly claim, was the first to have that wide-embracing title. It was the forerunner of many others outside the British Isles.

* * *

The subject matter of building research is inevitably very wide—as wide as the ramifications of the building industry itself—and this is well illustrated by the scope of the papers that are being presented to this Congress. They range over all the varied materials of building; the problems of structures; the techniques of building and its site operations; the requirements which buildings have to fulfil to meet the needs of their users; and the design and construction of buildings. Even so, the list is far from comprehensive, for one of the problems that faced the organizers of this Congress was how to limit it to reasonable dimensions. Building research impinges on town planning; it extends into sociology, and the fringes of the medical sciences; it ramifies to include such matters as plumbing, and it has to take account of the resistance of buildings to fire. None of these subjects has found effective expression in the programme, while the study of the economics of building is limited to but one or two examples. For this you may blame, but also, I hope, excuse, the organizers. To have extended the subject-matter still further would have taxed both their resources and your endurance.

For convenience the papers have been grouped into three divisions, but let us not make the mistake of thinking that any part of the whole can be regarded as a self-contained entity. The method of science is analytical; it breaks problems into component parts

for study by different scientific disciplines, but it also has the task of recomposing its data to form a coherent picture of some limited whole. I say limited whole, for the final synthesis of knowledge is surely the task of philosophy of which our President is such a distinguished exponent.

But let me return to our more mundane subject. The whole experience of building research points to the need for integration of its results. Building research, like many another branch of applied research serving a broad field of industry, does not split up neatly into the formal divisions of the sciences. Its problems often cut across the normal dividing lines; they go behind the physical sciences into psychology, sociology and economics, and they extend into the arts and crafts. Though the man of science may feel the ground growing steadily less firm as he moves away from the exact sciences, he can never forget that it is the response of man that is the test of a building, and that this response is conditioned by the whole environment rather than by any individual part of it.

For the building industry—whether personified as designer, builder or craftsman—to make effective use of building research, the results of different lines of investigation have often to be integrated and focused on particular problems. It is still, I think, too often imagined, and in this the building industry is far from singular, that research consists of the study of isolated problems, the solution to any one of which is complete unto itself. There are limited and simple fields in which this is true, but building is a complex operation of design, manufacture and construction in which major changes in any one particular procedure can rarely be made without many repercussions.

It is, indeed, the recognition of this that has led to the rapid development of building research organizations. But there is also another reason. Though the phrase "building science" may, for convenience, be loosely used, there is no separate science of building as such. Rather does building research consist of the application of many branches of science to the broad group of physical, biological, sociological, technological and economic problems that are encompassed within the ambit of the industry. In the three stages, planning, investigation and application, research needs not only the scientist and the engineer but also the architect and the builder, the economist, the worker in social studies, and the help of medical science. Research work extends outside the laboratory not only to investigations of building operations, of full-scale structures, and of conditions as they are in existing buildings, but also to full-scale trials in experimental building.

Building research is not the exclusive province of research organizations bearing that name. Major contributions come to it from the work of individuals or groups in Universities, in other research institutions, and in industry. The papers presented to this Congress bear witness to that. But, however important the sum total of these contributions, something additional is required to secure coherence, integration and application. The form this takes will vary in different countries according to particular habits of organization and needs. In some it may be limited to a committee or central body charged with the selection of investigations desired, with the stimulation of activities in existing institutions, and with voluntary collaboration. But this will often lead, as experience in this country and elsewhere has shown, to the more positive steps of setting up, first, specific research groups, and then a central research institution. It is of much significance that central building research organizations now exist in many countries throughout the world. The formation of these, many of them in recent years, reflects the importance now attached to the application of scientific research to this traditional industry.

The advance of science is continuously helped and fertilized by contact between workers of different nations. Building research is no exception to this rule even though the conditions of its application may vary from one country to another. The friendly relations that have been built up between building research organizations in different countries do much to promote mutual help and the pooling of knowledge and experience. The numerous international organizations that link together workers in particular branches of science and technology form another link in these relations. Recently the Housing Sub-Committee of the Economic Commission for Europe has initiated discussions on what further steps might usefully be taken to promote further collaboration.

This present Congress in itself mirrors the international character of building research and we are honoured to welcome here many leading workers from other countries.

Building and civil engineering construction form a substantial part of the annual capital investment of highly industrialized countries. In Great Britain in 1950 it amounted to some thirteen hundred million pounds, or 60 per cent of the total capital investment and 12 per cent of the national income. These proportions will apply with little alteration to many other countries. The prime purpose of building research is to help obtain the best return for this expenditure, whether it be by making buildings and structures cheaper in first cost, more economical in running and maintenance costs, or better fitted for their purpose.

The scope of building research has steadily broadened with the years. Investigations on materials and structures formed one of its early branches, developing, as scientific knowledge increased, out of the empirical trials and experiments that had long been made by engineers, architects and builders. As long ago as 1818 in "An Account of Experiments on the Strength of Materials," published in the Philosophical Transactions of the Royal Society, George Rennie remarked that "even in the present advanced state of knowledge the investigation of useful facts would yet admit of addition." How great that addition was to be would have passed his imagination. In recent years the introduction of new experimental techniques, such as those of electronics, and their application to engineering measurement, has provided potent weapons for furthering the study of structures. The application of X-ray and electron diffraction, and electron microscopy, to the study of materials, has served both to check and to extend knowledge of their fundamental nature. A new branch of engineering, soil mechanics, has arisen from the study of the behaviour of soil and gone far to show how buildings and structures may be saved from subsequent distress. Scientific excursions into what we may term the "internal climate" of the home date back, as we have seen, to the 18th Century. The study of heating and ventilation, lighting, acoustics and sanitation, have been actively pursued and extended to the factory, the office and the communal building. The Royal Festival Hall on the South Bank here in London provides the most advanced example of the combination of acoustic science and building design. The danger to life, and the material damage caused by fire, has led to intensive research on the fire resistance of buildings and to the establishment in several countries of the elaborate facilities needed for this work.

From these branches, building research has spread into new fields. Buildings are erected for use and must provide conditions that meet the needs of their occupants and are conducive to health, efficiency and comfort. As a complement to the well-established investigations into the physical environment in buildings, there have been developed sociological enquiries into the needs of the user. Though as yet in their early stages, such enquiries should help us to confirm, or lead us to question, some of the assumptions commonly made in planning and design.

Another important and interesting development of research has lain in the technical-economic sphere. In research on materials and structures we commonly and legitimately isolate technical problems for initial study. The application of their results will, in the final event, depend much on economic considerations, but these enter as a separate stage rather than as an integral part of the research itself. No similar separation of technical and economic factors is possible when we come to examine building operations, as, for example, the ways in which materials are handled, and built into place on the site. Here the performance of man and machine, economic

and technical data, have to be obtained side by side. Such investigations are none-the-less a proper and essential part of building research.

With the extension of its scope there have also been developments in the methods of building research. Field trials and studies on structures, old and new, and surveys of building practice, have long played a part alongside the work in the laboratory. The design and erection of buildings as the final stage of experimental and development work affords an invaluable test of the efficiency of constructional methods, or of equipment and services, and is one that is being increasingly used. It forms an essential supplement to the information that can be gained from modifications introduced in the normal work of the industry.

During the war the term "operational research" was introduced to describe an application of scientific methods of thought to the operations of war. Operational research has been given many definitions, but essentially it rests on the analysis of experience and observation with the aid of the powerful tools that modern statistical theory provides. It concerns itself with human operations and functioning systems, with the aim of improving their working and of providing yardsticks that can form a basis for executive decisions as to their future conduct. As a method it was not new to applied science or industry, but its techniques were developed and the type of problems to which they were applied much enlarged. The successes that came from its use in war have stimulated its increased application to the problems of industry, especially those falling in the technical-economic sphere.

Though not new in building, operational research has now been applied in a more positive and conscious fashion to the day-to-day operations of the building industry, to the study of methods of producing buildings, and to the assessment of economy, efficiency and satisfaction in use. The investigation of factors influencing productivity in the building industry, and of the use of mechanical plant in building operations, are two examples of its application in Great Britain. Another is to be found in the study of the efficiency and economy in actual domestic use of different methods of heating houses.

The application of scientific research to a traditional industry raises problems which are not present in modern industries which have grown from science. In no industry is this more true than the building industry, with its heterogeneous structure and its wealth of traditional methods and crafts, and where the introduction of scientific method can often conflict with habitual ways of thought. Tradition is both an asset of great value and a stumbling block to development. It enables operations to be carried on with a minimum of detailed instruction as long as basic methods and materials remain unchanged. It expresses the results of long experience to be ignored only with peril. But the reasons which underlie traditions may often be overlooked in their intuitive and almost automatic application. Part of the function of research is to make clear the scientific basis underlying traditional methods, so that they can be more readily and intelligently modified to suit changed materials, methods and circumstances.

The structure of the industry, with its separation of design, manufacture and assembly, does not facilitate the introduction of that which is new. Changes may involve action by each of these three separate branches, and experience in non-traditional methods of house building, for example, shows how much care and close collaboration is needed if potential successes are to be realized. Some of the papers presented to this Congress provide good evidence of this.

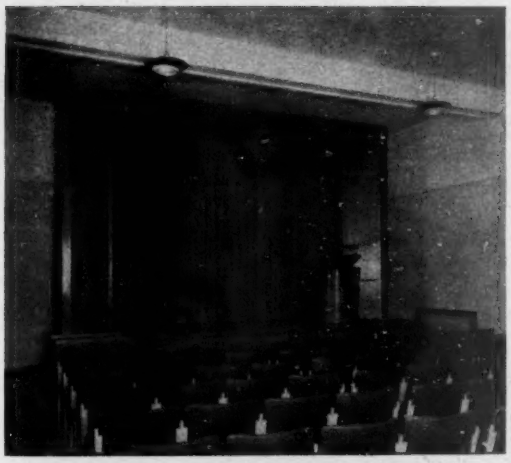
Apart from its engineering branches, and some of the larger manufacturers of materials and components, the building industry in this country, as in most others, is deficient in staff trained in the pure or applied sciences and has few research facilities of its own. The applications of research often need, therefore, to be worked out in detail, and demonstrated, before they can be absorbed into everyday practice. This involves an extension of research far beyond that required in industries that have a firmer scientific background.

The combination of modern technology and traditional method is an uneasy process in which there are many pitfalls, but it is the road that building has to follow and along which research must provide the guide.

We hear much of the time-lag between research and application. The means by which this can be reduced must be of vital concern to the building industry, for improvements in its methods can do much to give mankind those higher standards of living to which all aspire. While research in a manufacturing industry can be applied direct by the producer, there is, as we have seen, no such single channel through which the results of building research can be put into effect. They have to be applied, sometimes singly, but often severally, by the different branches of the industry. With responsibility divided, collaboration becomes essential if each branch is not to find very human reasons for any failure to secure collective advance. Building research organizations can do much to integrate the results of research, but in the end it is on the industry itself that progress depends.

Building is an adventure, both technical and, I am told, economic, and its outcome is never predictable in full. Research can reduce its risks and increase its fruits. That is our task.

Members of the Building Research Congress on the terrace at the Government reception, Lancaster House.



THE REHABILITATION OF THE WALKER GALLERY

THE Walker Art Gallery, Liverpool, one of the best-known provincial Galleries, has recently been entirely reconditioned and modernized. The gift of Sir Andrew Barclay Walker, the Gallery was originally opened by the donor in 1877. Although there have been alterations and additions since that date, the building largely retained its Victorian and Edwardian character until it was requisitioned in 1939 by the Ministry of Food, who only vacated the premises in 1949.

After a tour of inspection in 1949 by the Chairman of the Art Gallery Committee, the Art Gallery Director and the Museum Director, during which the most modern Art Galleries in Sweden, Denmark and Holland were visited, Dr. Ronald Bradbury, F.R.I.B.A., the City Architect and Director of Housing who accompanied the deputation, was instructed to prepare plans for the rehabilitation of the Gallery. It was reopened in July this year by Sir Kenneth Clarke, K.B.E., as part of the celebrations of the Liverpool Festival.

The principal structural alterations have consisted of the conversion of a ground floor gallery to a Lecture Hall and Cinema to seat 180 persons and fully equipped with sound film and slide lantern equipment, as well as record reproducer. A new separate entrance from Mill Lane, with Ticket Office and Cloakroom, has been provided to enable the Hall to be used independently of the Art Gallery by Artistic and Cultural Societies. Other structural work includes construction of a Picture Restoration Laboratory, and the provision of laylights beneath the previously unsightly lantern lights in the older galleries. New windows, which have been formed in the outer wall of the upper vestibule sculpture gallery, have provided better lighting in a previously poorly lit interior and have assisted in relieving the claustrophobic effect of continuous circulation through the necessarily top lit picture galleries.

In the main entrance hall, as well as at four other points on the Gallery circulation, rest spaces have been arranged in an effort to give a more informal and less institutional character to the interior.

The rehabilitation of the picture and sculpture galleries generally has entailed the complete redecoration of the rooms and the installation of a new and specially designed picture lighting scheme.

News of the BUILDING INDUSTRY

THE LONDON MASTER BUILDERS' ASSOCIATION held a reception at the Savoy Hotel on September 12 to which members and associates of the Building Research Congress were invited.

The President, Mr. Dudley F. Cox, and Mrs. Cox, received the many guests. Amongst those present were the Rt. Hon. Viscount Samuel, President of the Building Research Congress, and many overseas members of the Congress including Mr. R. F. Legget, Director of Building Research, Canada; Mr. Ian Langland, Chief, Division Building Research Commonwealth, Scientific and Industrial Research Organization, Australia; Mr. J. E. Jennings, Director of Building Research, South Africa; Mr. D. E. Parsons, National Bureau of Standards, U.S.A.; Mr. A. Marini, Directeur du Centre Scientifique et Technique du Battiment, France; Dr. C. A. Hart, Vice-Principal, Roorkee University, India; Dr. Walter Taylor, American Institute of Architects; Professor G. Wastlund, Sweden; Dr. O. Birkeland, Norway.

Mr. Alistair MacDonald, F.R.I.B.A., chairman of the organizing committee of the Congress, was there, so too was Mr. R. S. Wilshere, F.R.I.B.A., of Belfast; Mr. J. M. Aitken, A.R.I.B.A., of Stormont. Mr. Wilfred Woodhouse, A.R.I.B.A., had flown in from British West Indies narrowly missing the recent hurricane.

*

THAT TIMBER can successfully be used as a modern structural material is demonstrated in a new storage shed erected at Messrs. Beves and Co.'s Kingston Wharf, Shoreham-by-Sea. The span of this building is 105ft, the members of each truss being of stress-graded timber. The majority of members are of 1,000lb per sq in. The purlins are 1,200lb per sq in. Types of timber used include Douglas Fir, western Hemlock and European redwood. Photographs and details of the construction will be published in a future issue.

*

A SYMPOSIUM ON PRE-STRESSED CONCRETE is to be held at the Institution of Civil Engineers, London, on September 24 and 25. Membership is free. Applicants should contact the Organizing Secretary Symposium on prestressed concrete, Cement and Concrete Association, 52, Grosvenor Gardens, London, S.W.1.

*

THE L.M.B.A. has brought out a new edition of its "Wage Tables," carrying the wage rates from 2s 11½d, where they ended in the previous edition, to 4s 11½d. They show the wage due in 8ths of an hour, from ½th to 79 hours, which is assumed to be the highest multiple likely to be required.

The tables are printed in a stoutly bound book which can be obtained by members from the headquarters of the L.M.B.A. at 47, Bedford Square, price 7s 6d post free.

*

A REVISION of wood double-hung sash and case windows (Scottish type) (B.S. 644, Pt. 3, 1951) has been prepared to extend the range of windows to include types having spiral balance devices as the means of suspension of the sashes and a type in which the lower sash opens inwards for cleaning. The windows are available with or without astragals or with astragals in the upper sashes only.

The range of sizes covers single windows and combinations of two-light and three-light windows. The specification gives details of the construction of the windows and schedules of glass sizes and daylight glass areas.

*

THE BRITISH STANDARDS INSTITUTION have just published B.S.1755 "Glossary of terms used in the plastics industry."

This is one of the documents in the series which is being prepared to cover glossaries of terms used in various industries, and it is hoped that it will provide for greater uniformity and precision in the use of terms.

The document is of considerable importance at this juncture as it will form a basis for discussions on an international level by Technical Committee 61—Plastics of the International Organization for Standardization.

*

"FIXING FIBRE BUILDING BOARD WALL LININGS" (H.M.S.O., price 2d), No. 17 in the Advisory Leaflet series issued by the Ministry of Works as "guides to good building," gives hints to the practical man on the handling of insulating board and hardboard.

The leaflet, illustrated with simple diagrams, describes methods of fixing wall linings to timber frames and battens, with various spacing according to size and type of board; how joints, left open to allow for expansion, may be finished off; what nails should be used and how they can be hidden so as not to spoil the appearance.

Hints are given on handling boards to prevent damage, and on the precautions to be taken to allow for varying moisture content before fixing.

*

DONATIONS to the Builders' Clerks Benevolent Institution during the year 1950-51 amounted to £1,528 3s 11d.

Mr. W. Kirby Laing, M.A., A.M.I.C.E., succeeds Mr. Nigel Hannen, B.A., M.I.O.B., as President.

The L.M.B.A. has sent a donation of twenty guineas to the Institution, whose annual dinner takes place in the Café Royal on October 9.

*

THE DECREASE IN THE CONTROLLED PRICE OF METAL reduces the basic prices of copper by £7 per ton. Plain plates are now £278 10s, rods are £276 and sheets over 4ft are £277 10s. These prices are net per ton basis, with usual trade extras, and are not subject to discount.

*

THE ROAD HAULAGE ASSOCIATION states that increases in running costs since May, 1951, have been such that an average increase of 3 per cent on rates is justified from October 1 next, when the new wages scales for road haulage workers will be in force.

*

THE MINISTER OF WORKS has authorized an increase of 7½ per cent on the present list prices of Standard Metal Windows made in accordance with B.S.990. This increase, due to a recent rise in the cost of materials, is being applied by the British Metal Window Manufacturers' Association, Ltd., provisionally as a general increase, pending the preparation of a new detailed price schedule.

As a consequence of the general 7½ per cent increase in prices, the extra charge for the percentage addition in respect of rust-proofing is reduced from 25 per cent to 23¾ per cent.

The above alterations in price are effective as from September 4.

*

THORN ELECTRICAL INDUSTRIES LIMITED announce that their Lighting Division has moved its offices to: 233, Shaftesbury Avenue, W.C.2. Later in the year, a showroom will be opened there. The telephone number of the new address is TEMple Bar 1599.

*

MR. C. H. TUCKER, O.B.E., Sales Director of the Bristol Aeroplane Company (Housing), Ltd., left England by air on September 9 for a nine weeks' business tour of Canada, New Zealand and Australia.

Mr. Tucker will examine education, hospital and similar accommodation problems on the spot and will discuss "Bristol" permanent aluminium buildings with local authorities and leading architects in both urban and country districts.

*

AT THE INSTITUTE OF HOUSING annual conference in Scarborough (September 20-22) papers will be read by Mr. Wallace Smith, O.B.E., F.R.I.C.S., F.A.I., President of the Institute, on "The Economics of Housing," by Sir Thomas Bennett, C.B.E., F.R.I.B.A., on "Productivity in the Building Industry," by H. C. Hampton, F.R.I.C.S., on "The Economics of Maintenance," and by Hugh R. Ralph, F.I.M.T.A., on "Making Ends Meet."

*

BLACK & DECKER LIMITED have produced three new tools, the first of which—a 5in Handy-Utility Sander/Polisher—will be on the market early in September.

This tool is designed for simple and speedy Sanding, Polishing and Drilling of a wide variety of materials, including furniture, panelling, parquet flooring and linoleum and removing paint and rust. The tool can be used for rubbing down paints and undercoats; grinding, buffing and burnishings; drilling in steel, wood, brick, tiles, plastics, ceramics, etc.

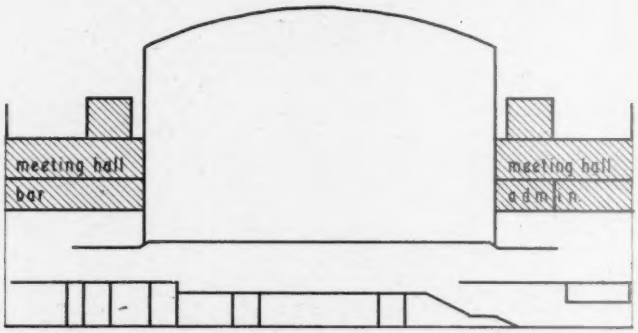
*

NATIONAL FUEL PROBLEMS and shortages, from the standpoint of the coal that is wasted in the form of smoke, will be the background of the three-day annual conference of the National Smoke Abatement Society which opens in Blackpool on September 26. Over 400 members and delegates from local authorities, technical bodies, Government Departments, and the fuel and power industries are already listed as attending.

"Power and Waste in their Social Setting" will be the theme of this year's Des Voeux Memorial lecturer, Dr. J. Bronowski, author and broadcaster, who is also Director of the Central Research Establishment of the National Coal board.

At one session representatives of the national coal, gas, electricity, iron and steel, and cement organizations will outline the policies being adopted for progressively preventing air pollution from these major industries.

THE ROYAL FESTIVAL HALL
HEATING AND VENTILATION



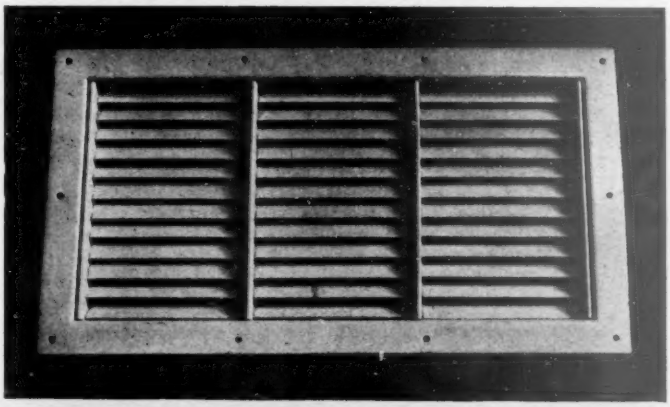
Above : diagrammatic section showing areas of heating and ventilation described in this article. Below : detail of the adjustable ventilators in the bar illustrated on the facing page.

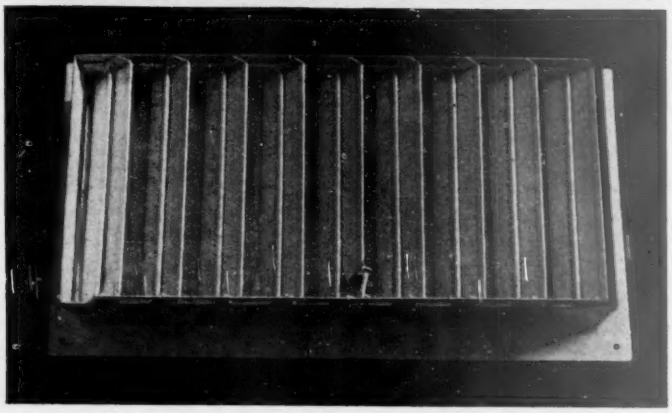
Designed by the L.C.C. Architects, Heating & Ventilation Section

Principal: R. Coe,

Assistant: R. J. Dickson, MM.I.H.V.E.

In Association with the Council's Chief Engineer





Flanking the auditorium at high level are meeting halls, offices and a bar.

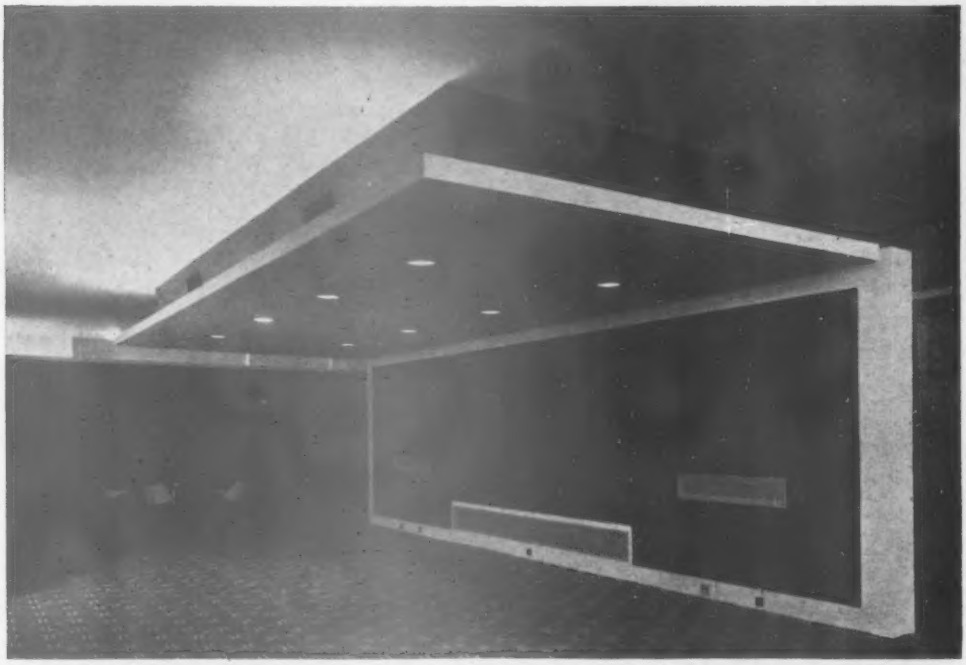
At the level above the meeting halls are open verandahs on which are funnel-shaped structures which contain small plenum plants serving the meeting halls.

Separate plants at lower level serve the administration offices, but extracts for both levels are connected into one system.

Plans and sections on page 324 show the layout of the main ducting.

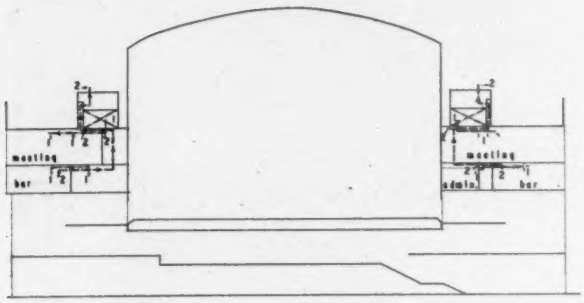
On page 323 the illustrations show, top : one of the meeting halls. The warmed air is supplied to this room through the adjustable grilles above the canopy and extracted through the large grille near floor level. The auxiliary heating units in this room draw air from behind the canopy which is then expelled, after passing over heating tubes, through the small grilles shown in the picture.

The lower illustrations show the bar. Here the main supply duct from the plenum on the roof above feeds through the grilles at main ceiling level. These grilles as shown in the detail picture on this page have two sets of adjustable fins. On the face the fins are adjusted by hand on a horizontal axis—giving upward or downward deflection. The back grilles are adjustable by key on a vertical axis and control air volume. The extracts from the bar are in the low ceiling. Additional heating elements are supplied by wall panels one of which is visible at the far end of the bar.



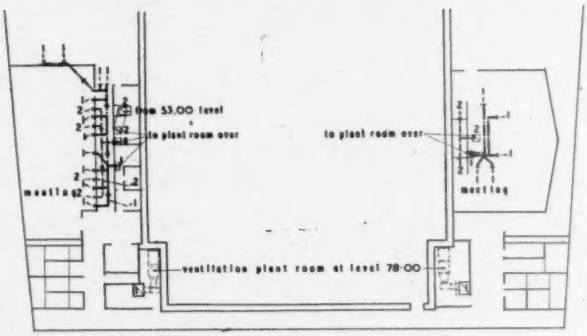
Top : one of the meeting halls described on the facing page. Below : the bar.

Royal Festival Hall, Heating and Ventilation



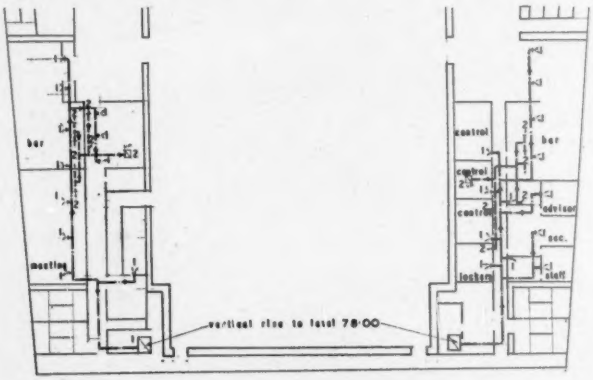
section

plenum air supply 1 —— air extract 2 ——



64·00 level

plenum air supply 1 —— air extract 2 ——



53·00 level

The principal air supply and extract runs for the rooms illustrated on pages 322 and 323 are indicated diagrammatically above.

OFFICE BOOKSHELF

ELECTRICITY

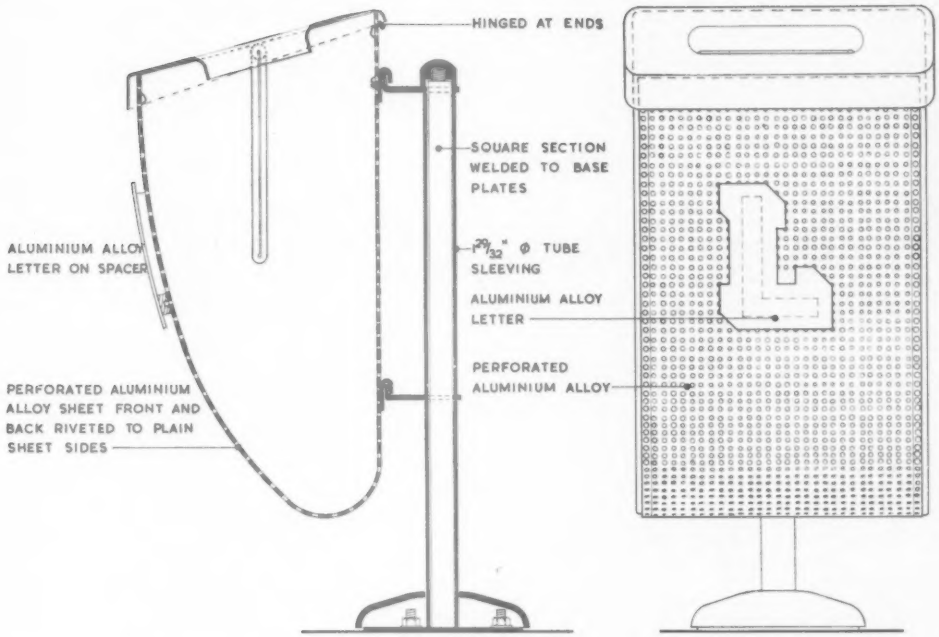
A book likely to be of very considerable interest to all concerned with the detailed problems of gas discharge lamps, their theory, construction and application is "Gas Discharge Lamps," by J. Funke and P J. Oranje (Philips Technical Library). The authors are well-known authorities on this subject and consequently the contents are extremely complete and up to date. This is an excellent translation of a book previously published in the authors' native country, Holland. The contents are not confined to the products of the Philips company. The work covers the general theory of gas discharge lamps, their auxiliary apparatus and the relation between the lamps and the associated equipment in the first part. The second part deals in detail with the various types of lamps such as sodium lamps, high and super-high pressure mercury vapour lamps and low pressure tubular fluorescent lamps. Another chapter refers to gas discharge lamps for beaconing and luminous advertising and a final one to stroboscopic lamps and flash tubes. There are a series of appendices giving abbreviations and symbols, general data on the lamps and equipment and a very complete bibliography of the subject.

PAINTING

All who have had anything to do with painting have had their troubles and would like to have been able to put them to some really knowledgeable person. "500 Questions about Painting and Decorating answered by James Lawrence" (The Sutherland Publishing Co., Manchester, price 12s 6d) sets out many of the questions one would have liked to have asked and no one is more competent to answer them than Mr. Lawrence. The book includes a really good index so that when a problem arises it is easy to find whether this book has, by chance, the answer and if so it will be quickly found. The questions are all based on actual problems which have arisen on jobs and many are related to points which any decorator is likely to meet from time to time. If time could be found to read right through all the 500 questions and answers the reader would acquire a very great deal of valuable knowledge. The book is well worth the price and one can have but one regret and that is that the cover is not stiff and may cause the book to become dilapidated long before the contents are valueless: thus the slight extra cost would have been a great benefit.

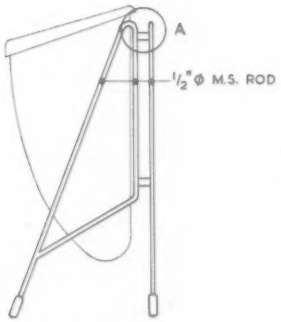
FIRE

There are few, if any fully explanatory books on fire escape requirements and one is usually left to sort out for oneself the requirements of bye-laws and similar legislation. "Escape from Fire, methods and requirements" by B. G. Phillips (E. and F. N. Spon, London, price 16s) will be found to be a thoroughly helpful guide as it summarizes and tabulates the requirements and how they should be met in the planning, construction and equipment of buildings. Escape is, of course, only one aspect of the larger subject of Fire in relation to buildings but it is probably the part with which architects and building owners are most concerned. This book should therefore be welcome to them and to local authorities and others who need quick reference to all matters associated with escape from fire.

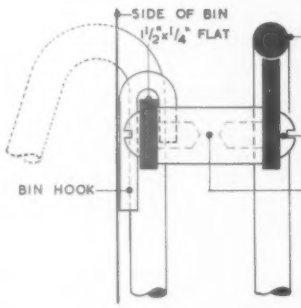

HINGED AT ENDS
SQUARE SECTION WELDED TO BASE PLATES
1 29/32" Ø TUBE SLEEVING
ALUMINIUM ALLOY LETTER ON SPACER
ALUMINIUM ALLOY LETTER
PERFORATED ALUMINIUM ALLOY
PERFORATED ALUMINIUM ALLOY SHEET FRONT AND BACK RIVETED TO PLAIN SHEET SIDES

FIXED SUPPORT TYPE · SECTION SCALE · EIGHTH FULL SIZE

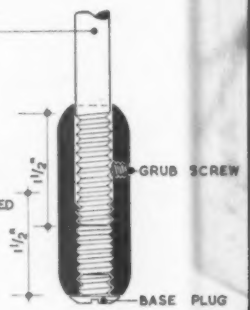
FRONT ELEVATION



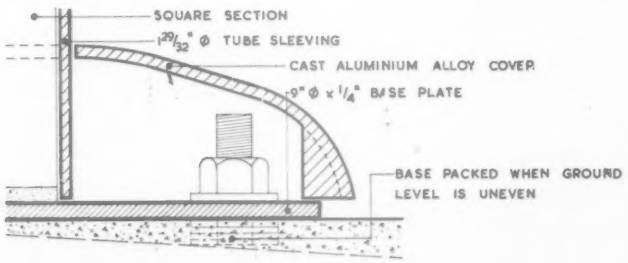
FREE STANDING TYPE
SCALE · 3/4" TO ONE FOOT



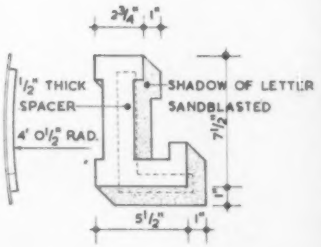
DETAIL AT A SCALE · HALF FULL SIZE



DETAIL OF LEG


SQUARE SECTION
1 29/32" Ø TUBE SLEEVING
CAST ALUMINIUM ALLOY COVER
9" Ø x 1/4" BASE PLATE
BASE PACKED WHEN GROUND LEVEL IS UNEVEN

SECTION OF BASE SCALE · HALF FULL SIZE



DETAIL OF ALUMINIUM LETTER
SCALE · EIGHTH FULL SIZE

STANDARD LITTER BIN: SOUTH BANK EXHIBITION
DESIGNER: JACK HOWE

The Advantages of

"PHARAOH" GYPSUM BROWNING PLASTER

Manufactured specifically to provide an economical labour-saving rendering or floating coat on high suction surfaces, such as BRICK, STONE, CLAY TILES, PUMICE SLABS, etc.

The modern method of plastering is to use Gypsum Plasters for undercoats rather than other materials which shrink when drying. The fact that Gypsum Plasters do not shrink is an important feature; their use eliminates the risk of shrinkage cracks in the finished work. It will be appreciated that it is an advantage that the base and finish coats should have the same chemical characteristics. By using Gypsum Plasters for both, the work is greatly speeded because succeeding coats can be applied on the same day.

MOISTURE. Gypsum Plaster combines chemically with a considerable proportion of the water used for gauging, so that where Gypsum Plaster is used there is less moisture to dry out into the building.

POROSITY. A noticeable characteristic of Gypsum Plaster. In effect the plaster breathes so that when moisture condenses on the plastered surface it is absorbed and the damaging effects of condensation are obviated.

COST. Whilst initial costs may be slightly greater than where the cheapest materials are used, an increasing number of experts are, day by day, becoming convinced that the small extra cost per house is more than offset by the increase in speed of erection and the savings in maintenance charges.

OTHER GRADES OF "PHARAOH" GYPSUM PLASTERS

"PHARAOH" Special Haired Plaster. For rendering and floating on metal lathing, or on Gypsum plasterboards, wood lathing, concrete and other low suction surfaces.

"PHARAOH" Gypsum Wall Finish Plaster. For high grade setting coats where a superior finish is desired. Applied neat it provides a surface to which the most delicate decorations can be safely applied.

ALL "PHARAOH" PLASTERS ARE MANUFACTURED FROM GYPSUM ROCK AND ARE THUS HIGHLY RESISTANT TO FIRE

SERVICE. Research and testing laboratories are maintained for the assistance of Architects, Building and Plastering Contractors, on all matters relating to the use of the Company's products. This service includes the testing of sands intended for use with Gypsum Plasters, and we recommend, whenever possible, samples of sand should be submitted. Suitable specifications for all classes of plastering will be gladly submitted on request.

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BPB

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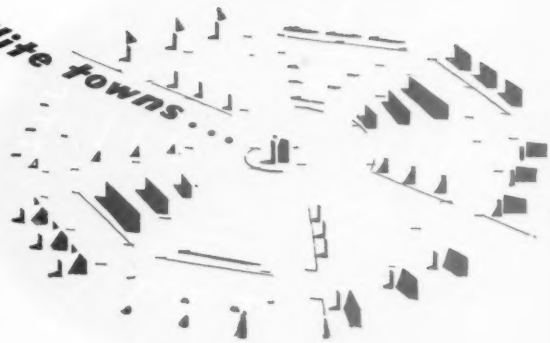
344·16

ASBESTOS-CEMENT

in the satellite towns . . .



The New Towns are to be self contained units, completely up-to-date in every way. Asbestos-Cement is being very widely specified for many of the buildings, including Houses, Schools, Factories, etc.

The illustration shows one of the first Factories to be completed in the "New Crawley" and is entirely roofed with "TURNALL" Combined Asbestos-Cement Sheeting, the double skin product providing reliable weathering, an inner lining and efficient insulation.

Architect : Albert E. Barnard, A.R.I.B.A., Victoria Street, S.W.1

Contractor : James Longley & Co., Ltd., Crawley.

TURNERS ASBESTOS CEMENT CO LTD

A MEMBER OF THE TURNER & NEWALL ORGANISATION

TRAFFORD PARK MANCHESTER 17

G14

GOOD PRACTICE IN DOMESTIC DRAINAGE—Part 2

by F. J. Crabb, B.Eng., M.I.C.E., F.R.San.I.

CONSTRUCTION—General

All sewers and drains should be constructed if possible before the start of other work on the buildings and a time schedule should be arranged in conjunction with those responsible for other work, to ensure this. Arrangements should be such that lengths of trench are left open for the shortest possible time before backfilling.

Setting out

The line of trench, positions of changes of direction and manholes must be accurately set out by means of pegs sufficiently long and strong to resist accidental disturbance. It is often convenient to offset the line of pegs by an even number of feet parallel to the trench centre-line so that it will remain for checking purposes after the trench is excavated. Temporary level bench marks must be established, on objects as immovable as can be found, at intervals near the line of the work, from which are set sight-rails at an even number of feet above invert level—not less than three sight-rails per length of drain at any one gradient.

Excavation and timbering

The safety of men working in excavations depends to a great extent on efficient timbering, and this should always be carried out by skilled timbermen, particularly if working in bad or uncertain ground.

There are three main methods of excavation for drains:—

(a) *In trench:* This is the normal method, and if done by hand, the following are the points to be considered.

(1) The turf or other surface material should be carefully set aside for use in reinstatement.

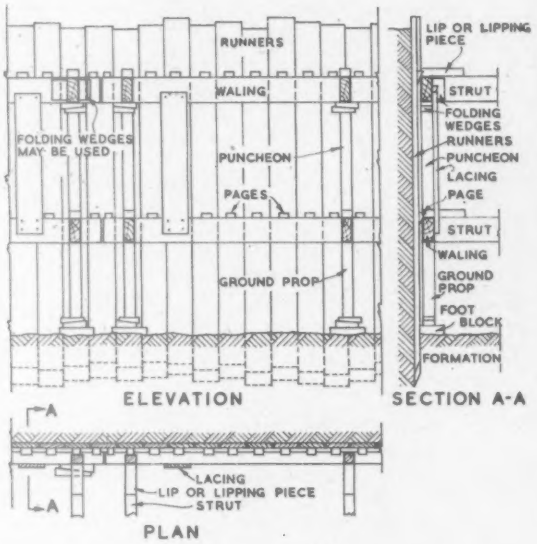
(2) Excavated material should be stacked at least 18in from the edge of the trench.

(3) Intermediate shovelling stages will be required in trenches between 6ft and 18ft deep. Below 18ft mechanical hoisting by skips is normally preferable.

(4) The width of trench at the bottom between sheeting should never be less than 1ft 9in, or the external diameter of the pipe plus 12in.

(5) In roads the work must be arranged, in conjunction with the Local Authority and the Police, so as to cause the minimum obstruction to traffic.

(b) *In heading or tunnel:* If the depth to invert is over 15ft, and if the ground is good, it may often be economical to lay the drains in heading, but it should be borne in mind that there is always a possibility of settlement above a heading, and the consequences of such settlement have to be considered. In work under roads, however, heading may be the best method, because it avoids breaking open the road surface, keeps the work clear of other services more easily and reduces the dislocation of traffic.



Working shafts should preferably be on the sites of manholes. The size of the heading should be as small as is consistent with room for a man to work both before and after the pipe is placed. The minimum may be taken as 4ft 6in high × 2ft 6in wide on the floor, measured inside timber. For small headings, shafts should not be more than 150ft apart.

(c) *By cut and drive:* At depths too shallow for normal heading work, a compromise is often adopted in which short lengths of trench are excavated, and connected together by short headings. If the ground is good enough for the short headings to stand without timber, this method will often prove economical at depths as shallow as 8ft. Where used in roads, the reduced amount of "spoil" lessens the obstruction to traffic.

Whatever system of excavation is adopted, the work must be kept free from water at all time, and one important precaution to take in this respect is to ensure that the flow from all land drains interrupted by the excavation is carried across the trench or shaft during construction, and the land drains replaced when backfilling the excavation.

In very bad ground, or where the level of the water table is above that of the finished work, special methods of subsoil consolidation or ground-water lowering should be used, such as chemical consolidation, or dewatering by the well point method, but for these or any other processes the advice of experts should generally be sought.

Concreting

The subject of concreting for drainage work is fully dealt with in Code of Practice 301, and limitations of space here will not allow of more than the following brief notes:

(a) All concrete shall be proportioned in proper gauge boxes, cement to be added by weight (1 cwt = 1¼ cu ft).

(b) Concrete should be placed and thoroughly tamped by hand.

(c) Joint holes must be formed in the concrete bed, or

(d) Pipes may be laid on small pre-cast blocks, and then the concrete is poured round the pipes in one operation.

(e) Chutes not steeper than 60° to the horizontal must be used if the drop is more than about 8ft 0in.

(f) All new work should be kept covered with damp sacking for at least 48 hours.

(g) Concrete laid under water should have its cement content increased by 30%. (Do *not* dump it dry into a wet trench).

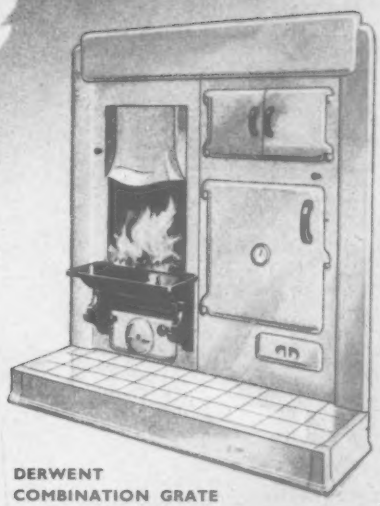
(h) P.C. Concrete should not be mixed or placed until rising air temperature has reached 34°F. Concreting should stop when falling temperature has reached 38°F, and be covered with tarpaulin or other covering.

(i) No frozen materials should be used for concrete, nor should concrete be placed in frozen ground.

(j) Rapid-hardening cement is a help in cold weather.

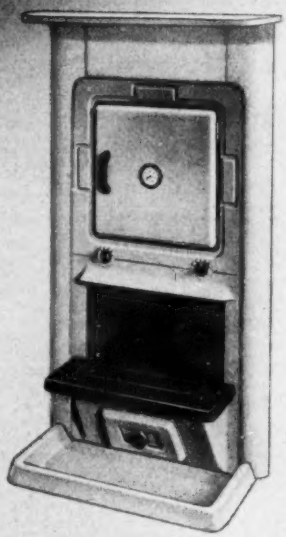
Domestic EFFICIENCY

APPROVED BY THE MINISTRY OF FUEL AND POWER. EACH MODEL CONFORMS TO THE APPROPRIATE BRITISH STANDARD.



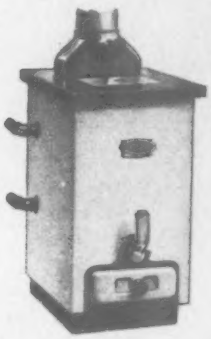
DERWENT COMBINATION GRATE

Efficient and economical fire provides heat for a large oven, fast-boiling hotplate with extension hob ; hot closet. Ample domestic hot water and controlled room warmth. Overnight burning.



MILFORD OVEN-OVER-FIRE COMBINATION GRATE

At last, the perfect oven-over-fire grate. For space heating, water heating, cooking. Has withstood every test. Boiling space for five saucepans. Flue cleaning without removing ovens.



BOILERS B33 AND B22

Waterway encircles fire and gives high output per square foot of heating surface. Bright, clean finish, minimum cleaning. B33 has steel water jacket. B22 cast-iron.

GLOW-WORM

GLOW-WORM BOILERS LTD. · DERWENT FOUNDRY · MILFORD · NR. DERBY

London Showrooms : 22-24, Buckingham Palace Road, London, S.W.1

Pipelaying and jointing

Pipes should be examined for soundness before laying, and should be laid with sockets leading up the grade, the barrel of the pipe resting on a solid and even foundation for its full length. Socket holes must be formed in the trench bottom, or the concrete bed, to enable joints to be made. If the excavation has been carried too low, any necessary packing up should be in concrete. The following is the recommended method of laying:—

The sight rails should be checked and, if necessary, re-established at an even number of feet (equal to the length of boning rod to be used) above invert level, and the centre line of the work marked on the rail with a clear vertical mark, and a saw cut on the top edge of the rail. Stout pegs should then be driven into the trench bottom at intervals at least 3ft less than the length of straight-edge to be used, until their tops are exactly at invert level (this is done by means of the boning rod and sight rails). A straight-edge resting on the tops of these pegs will give the level and gradient of the pipes, the pegs being withdrawn as pipelaying proceeds. A side line strung tautly at pipe-axis level, between iron pins on the trench floor should be used to obtain a true line for the pipes.

Jointing of pipes should be done as follows:—

(a) Glazedware pipes should have a ring of tarred yarn wrapped round the spigot of the pipe, which is then pushed well home in the socket of the last laid pipe. The Plumbing Committee, in their Report, recommended untarred yarn dipped in cement grout. This ring should be caulked so as to fill not more than ¼ of the socket depth. The socket should then be filled with a stiff mix of 1:1 cement mortar formed to a fillet at 45° with the pipe. (The Plumbing Committee recommend 1:2 cement mortar.) A scraper or "badger" should be drawn through the joint immediately to ensure that no mortar has found its way inside the bore. Damp sacking should be used to protect the joints until fully set.

(b) Concrete pipes are similarly jointed, but care must be taken to make the spigots and sockets thoroughly wet before jointing.

(c) Cast-iron pipes may be jointed with run-lead, fibrous lead (cold caulked) or Portland cement.

There are a number of special joints available, for salt glazed ware, concrete, and cast-iron pipes, each of which has its special advantage, such as flexibility, ease and speed of making, etc.

Manhole construction

Brick manholes should be built of Class B Engineering Bricks in English bond, with cement mortar not weaker than one part cement to three parts of sand. The jointing faces of each brick should be well "buttered" with mortar, so as to ensure a full joint, and no "flushing up" should be allowed. Bricks with "frogs," if used, should be laid with "frog" uppermost. The internal faces of the walls should be flush-pointed; internal rendering of walls is not recommended.

In very bad cases of external water pressure, external rendering of the walls and shaft may be adopted. All arches and circular work of less radius than 3ft must be carried out in radiated bricks. The bedding of cover frames should be done with the cover in position, to prevent any possible twisting of the frame.

Concrete manholes should be built of best quality concrete (1:2:4) and the internal shuttering should be such that a sufficiently smooth finish is left on the walls, so that rendering is not required.

Backfilling

It is very important in filling-in a trench to ensure that the pipes are not damaged or displaced. The lower part of the trench should be very carefully filled with selected fine material, hand packed around the lower half of the pipes and continuing to 12in above the pipe. This layer should be watered and evenly rammed with a wooden rammer. Filling can then continue in layers not more than 12in thick, each layer being well rammed and if necessary watered. Large stones should be kept aside until filling near the surface. Filling by means of bulldozers is not recommended unless layers are restricted to 12in and each is carefully rammed. Trenches should be left proud of the surface, to allow for settlement. Headings under roads or near buildings should be filled with 1:12 concrete, or hand-packed hardcore, broken rock or brickwork. In more open country headings may be filled with the excavated material packed tightly in layers and rammed by hand. Manhole excavations should be filled around the chamber with 1:20 concrete, or in suitable soils, by the hand packing of selected hard material. In the case of "in situ" concrete manholes, it will often be more economical to fill the whole excavation round the chamber with the construction concrete. Filling round the access shaft may be done with excavated material in 12in layers, well rammed. Precast concrete manhole excavations should be filled with 1:6 concrete to about 6in above the top of the taper.

Reinstatement of surfaces

In most cases the Highway Authority requires the owner to carry out a temporary reinstatement of road surfaces, subsequently carrying out the permanent reinstatement themselves at the owner's cost. Alternatively the owner may carry out the permanent reinstatement to the satisfaction of the Authority, after proper consolidation has taken place. In places other than roads, care must be taken to replace the top soil or turf which should have been put aside from the remainder of the excavated material.

TESTING

The normal method of testing drain lines is the water test, and this should be applied to every length of drain before the pipes are haunched or covered in, and repeated after back-filling. The test is carried out by plugging the lower end of the length under test, and any branches connected to it, and filling the system with water. A bend and a length of straight vertical pipe should be temporarily jointed to the upper end to provide the required head, which should be not less than 5ft at the highest point of the section. If, because of a steep fall, and considerable length of drain, this should result in a pressure greater than 15lb per sq in at the lower end, some arrangement must be made to test in sections, or another form of test used.

Subsidence of the test water may be seen in the vertical pipe, and after refilling to allow for some absorption, the test pressure should be held for at least ten minutes.

The air test may be used where it is difficult to apply the water test, e.g., the supply of water or facilities for its disposal may be inadequate—and this is done by plugging the pipes at each end of the section and pumping air in through one of the plugs.

A manometer is connected to the air system, and a pressure of 4in of water should not fall below 3in in 5 minutes. This test is more delicate than the water test, but is only a proof of *tightness* and not strength; as there is usually a risk that in the event of a blockage the drains might be subjected to considerable water pressure, the water test should be used wherever possible. Drains should also be tested for straightness and internal smoothness either by putting in at the top end a smooth ball of ½in less diameter than the pipes, or by a mirror at one end illuminated by a light from the other, which should show a full circle of light if there is no obstruction.

CESSPOOLS AND SMALL SEWAGE TREATMENT PLANTS

There are two ways of dealing with sewage from buildings when there is no main sewerage system available; it may either be stored in a cesspool, and removed periodically, or a small plant may be built which will purify the sewage sufficiently for it to be discharged into the nearest stream.

Cesspools

A cesspool should only be used if it is quite impossible for economic or other reasons to construct small treatment works. Before deciding on a cesspool very full enquiries must be made as to the emptying facilities; any powers to control cesspool construction which may be vested in a River Board or Water Undertaker; the nature of the subsoil and details of any springs or wells or other water likely to be contaminated.

A cesspool should be located as far as possible from any inhabited building or well, and preferably on ground which slopes away from the buildings. Road access for the emptying vehicles as near to the cesspool as possible should be provided.

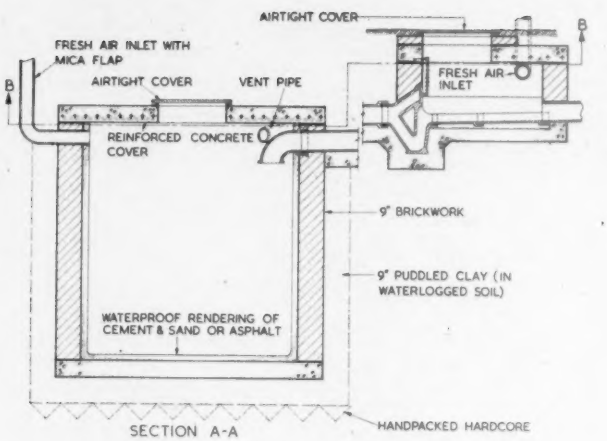
The capacity of a cesspool should be about 45 days' dry weather flow at 30 gallons per head per day, or the whole discharge of sewage between emptyings. Surface water and subsoil water must not be discharged into a cesspool.

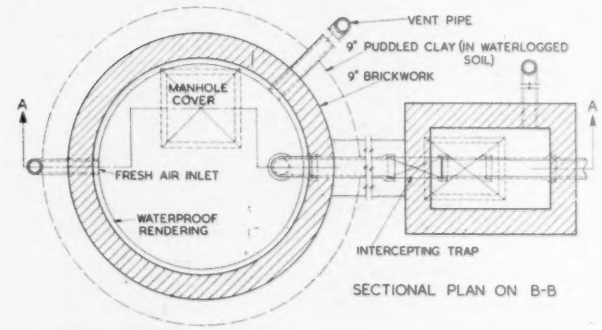
The Ministry of Health Model Byelaws give the following regulations as to the construction of a cesspool:—

"A cesspool shall be so constructed as to be impervious to liquid either from the outside or the inside, and if constructed of brickwork shall be rendered inside with cement and sand in suitable proportions or properly asphalted, and if constructed in a soil liable to be waterlogged shall be backed with not less than 9in of well-puddled clay."

The usual shape is circular and the diameter should be about the same as the depth below the invert of the incoming drain. A cesspool must be efficiently ventilated and have an intercepting trap to disconnect the house drains from it.

The emptying of a cesspool may either be done by a cesspool-emptying vehicle—which is a tank lorry of 800-1,000 galls capacity, fitted with a suction pump which draws the contents of the cesspool into the tank; or some form of lifting gear (usually a chain pump) may be permanently fitted to the cesspool so that the contents may be discharged over the land.





A TYPICAL CESSPOOL

The latter method often gives rise to nuisance, and should be avoided wherever possible.

Small Treatment Works

A sewage treatment plant for isolated buildings usually consists of one of the following arrangements:—

A septic tank, the effluent from which is given secondary treatment on the land by surface irrigation. A septic tank with a percolating filter as the second stage. A surface aeration tank and settling tank.

It should be borne in mind that whatever form of plant is adopted, it will need a certain amount of attention and maintenance to ensure efficient working, and arrangements for this are of the utmost importance.

I will describe briefly the items of plant mentioned above, but would strongly advise the calling in of specialist advice in all but the simplest cases.

(a) *Septic Tank.* A septic tank is a vessel in which sewage is retained long enough for considerable settlement of solids to take place, and to allow anaerobic bacterial action to transform some of the solid matter into liquids and gases, leaving at the bottom a black sludge and at the top a thick scum, both of which have to be removed at intervals. For dealing with one or two houses, the tank should hold 24 hours' flow at 100 g.p.d. but the capacity may be reduced for larger flows until for a daily flow of 2,000 galls, a capacity of 12 hours' flow will be enough. A septic tank should be rectangular on plan, 2 to 3 times as long as it is wide, and the bottom should slope downwards to the inlet, the average depth being 3 to 4 feet. In a small installation, a septic tank may be formed of standard concrete pipe sections.

The inlet should be designed so that the velocity of flow is reduced and the incoming sewage does not disturb the settling solids. This is usually done by means of a vertical T-pipe, the upper leg of which is accessible for rodding purposes. The outlet should be over a weir protected by a scum board. The tank should always be covered, and the cover efficiently ventilated.

The sludge must be removed from a septic tank every 3-6 months, and the cesspool emptier is most convenient for this.

(b) *Percolating filters.* These are not filters in the strict sense of the word but beds of broken stone or other suitable substance (called the medium) over which is sprinkled the effluent from a septic tank. The surfaces of this medium become coated with an organic film which encourages the growth of micro-organisms which oxydize the remaining suspended and colloidal solids, leaving an effluent which may be discharged to a stream or lake. Suitable materials for the medium are granite, whinstone, clinker, slag, washed ballast and metallurgical coke, and it should be broken to 3in gauge at the bottom diminishing to 1in or ¾in at the top of the bed. The filter should be 4 to 5ft deep, and its size (either rectangular or circular) based on about ¾ cu yd of medium per head of population served. A percolating filter may be fed with the tank effluent either by fixed channels or by a rotating-arm distributor driven by the reaction of the discharging liquid. A rotary distributor will operate with as small a head as 18in.

(c) *Pumping.* Small plants should always be sited if possible on ground which slopes away from the building, but where this is impossible it will often be necessary to pump the effluent to a suitable level for its final disposal. This should be done by lifting the septic tank effluent to the filter. The pump should preferably be electrically driven, with some form of automatic control.

(d) *Surface aeration.* This is really a simple form of activated sludge treatment, but although it is extremely efficient, it calls for a small amount of regular (daily) attention, and can only be used in cases where this is available. The sewage passes through a small detritus tank to the aeration tank where its surface is violently agitated by a fast-revolving impeller. The oxydation caused by this and also the introduction of bacterially active sludge from the third or settling tank, induces a large degree of bacterial purification. The effluent from the aeration tank then flows to a settling tank where the sludge settles out, and the final effluent is discharged to a stream or other convenient place.

(e) *Disposal of effluent.* The final effluent from a percolating filter or a surface aeration plant may be disposed of to the nearest stream or lake (with due consideration of any conditions which may be imposed by a Rivers Board or other competent Authority). Where a septic tank effluent is given land treatment, it should be led through a system of shallow trenches or carriers, which should be of sufficient extent and so arranged that portions of the area may be "rested" in turn.

The Illustrations are reproduced by permission of the Council for Codes of Practice from Code 301 (1950) "Building Drainage." Copies of the code can be obtained from the British Standards Institution, 24 Victoria Street, London, S.W.1.

CONTRACT • NEWS •

Notes below give basic data of contracts open under locality and authority which are in bold type. References indicate: (a) type of work, (b) address for application. Where no town is stated in the address it is the same as the locality given in the heading, (c) deposit, (d) last date for application, (e) last date and time for submission of tenders. Full details of contracts marked ★ are given in the advertisement section.

OPEN

BUILDING

ALCESTER R.C. (a) 12 houses, Crooks Lane. (b) Messrs. F. B. Andrews and Son, 95, Colmore Row, Birmingham. (c) 2gns. (e) Oct. 2.

* * *

ASHBY-DE-LA-ZOUCH R.C. (a) 30 houses and construction of 1,700 sq yds of roadworks, 385 yds of 9in sewer and 340 yds of 3in water main at the Coronation site, Oakthorpe. (b) Architect and Engineer, Council Offices, South Street. (c) 4gns houses and roadworks or 2gns roadworks only. (e) Oct. 1.

* * *

BLACKBURN B.C. (a) Alterations and additions for conversion of "West Bank," 92, Preston New Road, into an aged persons' home. (b) Harold Cooper, Richmond Chambers. (d) Sept. 24.

* * *

BUNGAY U.C. (a) 5 pairs of houses, Hillside Road. (b) Messrs. Buckingham and Berry, 10, Thorpe Road, Norwich. (c) 1gn. (e) Sept. 28.

* * *

DARTFORD R.C. (a) 14 houses, Ladywood Road, Darenth. (b) Engineer and Surveyor, Council Offices, West Hill. (c) 2gns. (e) Oct. 1.

* * *

DOLGELLY R.C. (a) Block of 3 houses and 1 block of 4 houses. (b) M. T. Pritchard, Victoria Buildings. (c) 2gns. (e) Sept. 28.

* * *

DURHAM C.C. (a) Alterations and additions at Stanley Fire Station. (b) County Architect, County Architect's Office, Court Lane. (e) Sept. 28.

* * *

ELLESMERE PORT U.C. (a) 32 pensioners' bungalows, Faraday Road, Orchard Farm Estate. (b) Sub-Office of the Engineer and Surveyor, Queen Street. (c) 3gns. (e) Oct. 8.

* * *

ESSEX C.C. (a) Junior School, Cressing Road, Witham. (Steel frame construction, approx. value of contract £50,000.) (b) County Architect, County Hall, Chelmsford. With full details. (d) Sept. 22.

* * *

ESSEX C.C. (a) Primary school at L.C.C. site No. 7, Barretts, West Ockenden. (Steel frame construction, approx. value of contract £83,000.) (b) County Architect, County Hall, Chelmsford. With full details. (d) Sept. 22.

* * *

GIPPING R.C. (a) 8 houses, Wetherden. (b) Engineer and Surveyor, Council Offices, Needham Market, nr. Ipswich. (c) £3. (e) Oct. 6.

* * *

GRANTHAM B.C. (a) 16 bungalows, Harrowby Lane area. (b) Borough Engineer, Guildhall. (c) 2gns. (d) Sept. 24.

* * *

HARTLEPOOL B.C. (a) Block of 10 shops and 11 houses at West View. (b) Borough Engineer, Borough Buildings, Middlegate. (c) 2gns. (e) Sept. 27.

* * *

LEICESTER C.C. (a) Public convenience in Evington Park. (b) City Architect's Office, 10, Loseby Lane. (c) £1. (e) Sept. 28.

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LITHERLAND U.C. (a) 82 houses and 18 old age pensioners' bungalows, Netherton Park Estate. (b) Council's Surveyor, Town Hall. (c) 5gns. (e) Oct. 1.

* * *

LONDON-HENDON B.C. (a) Contract No. 2. 55 houses, Kenilworth Road, Edgware. (b) Borough Engineer, Town Hall, N.W.4. (c) 3gns. (d) Sept. 25.
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* * *

MALDEN AND COOMBE B.C. (a) Block of 18 flats at Coombe Road. (b) Borough Engineer, Municipal Offices, New Malden, with details of contracts upon which previously employed. (d) Sept. 22.

* * *

MERIONETH E.C. (a) Primary school, Llanuwchllyn, nr. Bala. (b) County Architect, County Offices, Dolgelly. (c) 3 Gns. (e) Sept 29.

* * *

MIDHURST R.C. (a) (1) 4 cottages and 4 flats, June Lane. (2) Block of 4 cottages, Lurgashall. (b) T. Greenfield, "Newstead," Midhurst. (c) 1 Gn.

* * *

MITCHAM B.C. (a) Erection of Pollards Hill Community Centre. (b) Borough Engineer, Town Hall. (d) Sept. 29. (e) Oct. 16.

* * *

NORTHWICH U.C. (a) Health Depot in Leicester Street. (b) F. L. James, Council Offices, Church Road. (c) 3 Gns. (e) Oct. 1.

* * *

OLDHAM B.C. (a) Junior school, Fitton Hill. (Separate trades.) (b) C. T. Taylor, Roberts and Bowman, 10, Clegg Street. (c) 2 Gns. (e) Oct. 5.

* * *

ONGAR R.C. (a) 22 houses, Shelley Estate. (b) Council's Engineer, Bowes Field, High Street, Chipping Ongar. (c) 2 Gns.

* * *

PLYMOUTH C.C. (a) (1) 48 3-storey flats in 3 blocks, Whitleigh, (2) 7 aged persons' bungalows at Ernesettle, and (3) garage and pram shelter at 1, Tangmere Avenue, Ernesettle. (b) City Architect, Seymour Road. (c) 3 Gns. each contract. (d) Sept. 24.

* * *

PORTSMOUTH C.C. (a) 42 flats (steel-framed construction) at St. George's Square. (b) Messrs. A. E. Tutte and Son, 10, King's Terrace, Southsea. (c) 3 Gns. (d) Sept. 28.

* * *

PORTSMOUTH C.C. (a) Contract No. 1. 63 flats in 9 blocks at King's Road, Hambrook Street area. (b) City Architect, Municipal Offices, 1, Western Parade. (c) 3 Gns. (d) Sept. 28.

* * *

RIPLEY U.C. (a) Public conveniences at Heage and Ambergate. (b) Council's Surveyor, Town Hall. (c) 2 Gns. (e) Sept. 27.

* * *

SOUTHAMPTON B.C. (a) Infants' school at Rossington Avenue, Bitterne Park. (b) Borough Architect, Civil Centre. (c) 2 Gns. (d) Sept. 24.

* * *

UPTON-UPON-SEVERN R.C. (a) 28 houses at Kingshill. (b) Messrs. Pemberton and Bateman, 21, Vine Street, Evesham, Worcs. (c) 2 Gns. (e) Oct. 5.

* * *

WESTHOUGHTON U.C. (a) 24 houses on Hindley's Estate. (b) Council's Clerk, Town Hall. (c) 2 Gns. (e) Oct. 1.

* * *

WORKSOP R.C. (a) 20 houses in Festival Avenue. (b) B. D. Thompson, 83, Bridge Street. (c) 3 Gns. (e) Oct. 2.

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WORCESTER C.C. (a) Second portion of conversion of Fort Royal House, Fort Royal Hill, as Children's Home. (b) City Engineer's Office, 22, Bridge Street. (c) 2 Gns. (e) Sept. 28.

MISCELLANEOUS

WELSH REGIONAL HOSPITAL BOARD. Applications invited for inclusion in the Board's list of approved Contractors for hospital building projects. Three lists will be maintained covering small, medium and large projects. Applications to Board's Secretary, Temple of Peace and Health, Cathays Park, Cardiff, by September 28th, stating (a) names and addresses of 3 referees, preferably Local Authorities, Government Departments or National Boards, (b) description and cost of works executed, (c) maximum cost of works for which applicant would be prepared to tender, (d) extent of area in which applicant would be prepared to work.

PLACED

Notes on contracts placed state locality and authority in bold type with (1) type of work, (2) site, (3) name of contractor and address, (4) amount of tender or estimate. † denotes that work may not start pending final acceptance, or obtaining of licence, or modification of tenders, etc.

BUILDING

BURNLEY CORPORATION. (1) 104 "No Fines" houses. (2) Brick House, Palace House sites. (3) Geo. Wimpey and Co., Ltd., The Grove, Hammersmith, W.6. (4) £148,973.

* * *

AIR MINISTRY. (1) Runways and other construction works. (2) National Aeronautical Establishment, Bedford. (3) John Laing and Son, Ltd., Mill Hill, N.W.7. (4) £3,000,000.

* * *

DARLINGTON. (1) New estate of 440 houses, 12 shops and public house. (2) Skerne Park Estate. (3) Delahope, Ltd., Fawcett Street, York. T.C. approved outline layout.

* * *

NORFOLK C.C. (1) Police headquarters. (2) King's Lynn. (3) Kerridge (Cambridge), Ltd., Sturton Street, Cambridge. (4) £90,160.

* * *

LONDON W. (1) Block of offices. (2) Bond Street. (3) Holland and Hannen and Cubitts, Ltd., 1, Queen Anne's Gate, London, S.W.1. (4) About £300,000. Architect: Michael Rosenaer, 86, Brook Street, London, W.1.

* * *

OLDBURY B.C. (1) 93 houses. (2) Leftwich Old Hall Estate. (3) Titford Property Co. (Langley), Ltd., Wolverhampton Road, Langley, Birmingham.

* * *

FARNWORTH U.D.C. (1) 81 houses. (3) E. F. Davis, Ltd., Bank Street, Farnworth, Lancs. (4) £96,000.

* * *

WORSLEY U.D.C. (1) 118 houses. (3) G. and J. Seddon, Ltd., 5, Manchester Road, Little Hutton, Bolton, Lancs.

* * *

WIMBLEDON B.C. (1) Three blocks of flats and houses. (2) West Side. (3) Beattie and Partners, Ltd., 69, St. Martin's Lane, London, W.C.2. (4) £119,000. Roads and sewerage: W. H. Gaze and Sons, Ltd., Kingston-on-Thames. £22,058.

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NOTTINGHAMSHIRE C.C. (1) Primary school. (2) Kirkby-in-Ashfield. (3) Greenwoods, Ltd., 2, Wood Street, Mansfield. (4) £52,193.

* * *

HEMEL HEMPSTEAD. (1) Erection of factory, for Rolls Razor, Ltd. (3) J. Jarvis and Sons, Ltd., 12, Buckingham Palace Gardens, London, S.W.1. (4) £60,000.

* * *

BRISTOL CORPORATION. (1) Total of 408 "Easiform" houses. (2) Henbury Estate. (3) John Laing and Son, Ltd., Mill Hill, London, N.W.7.

* * *

LIVERPOOL. (1) Rebuilding factory for F. W. Berk and Co., Ltd. (3) W. Tompkinson and Sons, Ltd., Great Newton Street, Liverpool.

* * *

SWINDON B.C. (1) 168 "Easiform" houses. (2) Penhill Estate. (3) John Laing and Son, Ltd., Mill Hill, N.W.7. (4) £220,299.

* * *

WOLVERHAMPTON B.C. (1) 48 flats and maisonettes. (3) A. F. R. Godfrey and Co., Ltd., Clifton Street, Wolverhampton. (4) £69,000.

* * *

BIDDULPH (STAFFS), U.D.C. (1) 110 houses. (2) Park Lane Estate. (3) J. Gerrard and Sons, Ltd., Swinton, Manchester. (4) £158,759.

* * *

WOOLWICH. (1) Out-patients department. (2) Woolwich Memorial Hospital, Shooters' Hill. (3) Greenaway and Son, Ltd., 265, Lordship Lane, S.E.22. (4) £68,200.

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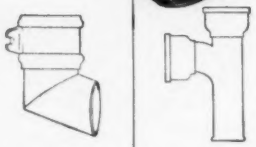

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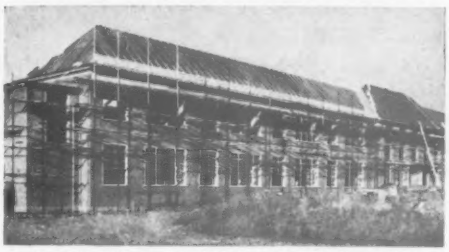

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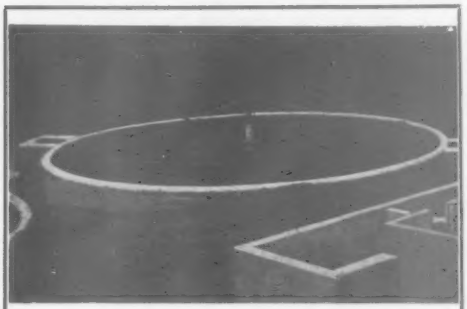

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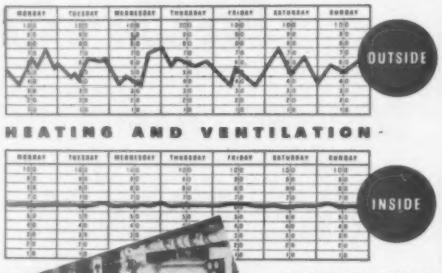

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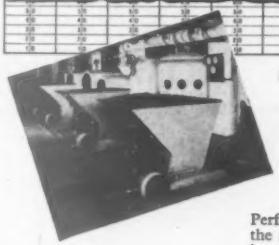

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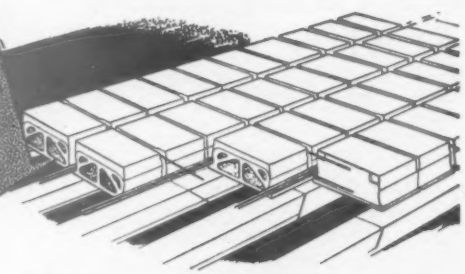

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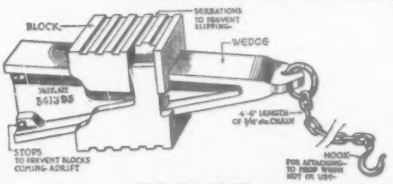
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APPOINTMENTS

COUNTY BOROUGH OF GREAT YARMOUTH

APPOINTMENT OF GENERAL ASSISTANT ARCHITECT

APPLICATIONS are invited for the appointment of a GENERAL ASSISTANT ACHITECT in the Borough Engineer's Department, for housing, seaside and general work, at a salary in accordance with A.P.T. Grade IV (£530-£575).

Applicants should have passed the Intermediate Examination of the R.I.B.A. The appointment will be terminable by one month's notice on either side, subject to the provisions of the Local Government Superannuation Act, 1937, and to the passing of a medical examination. The Council are unable to offer housing accommodation to the successful candidate.

Applications, stating age, qualifications and experience, together with the names of three persons to whom reference may be made, should be enclosed in an envelope endorsed "General Assistant Architect," and must be received by me not later than Friday, the 28th September, 1951.

Candidates must disclose in writing whether they are related to any member or officer of the Council. Canvassing, directly or indirectly, will disqualify.

FARRA CONWAY,
Town Clerk.

Town Hall,
Great Yarmouth.
4th September, 1951. [5781

LANCASHIRE COUNTY COUNCIL

APPLICATIONS are invited for the following appointments in the County Planning Department:—

1. SENIOR PLANNING ASSISTANTS (ARCHITECTURAL), A.P.T. VI (£645-£710), required at Headquarters, Preston. Duties include design and preparation of detailed layouts for housing schemes, village extensions and central area improvements. Candidates must be qualified architects.

2. PLANNING ASSISTANT, A.P.T. I-V (£440-£620), required at the Liverpool Divisional Office. Salary commensurate with qualifications and experience. Candidates for Grade V should be qualified by professional examination as Architects, Surveyors, Engineers or Town Planners, and for Grades I-IV should possess a University Degree or the Intermediate Certificate of an appropriate professional body.

Applications, stating clearly appointment applied for, and giving the names, addresses and qualifications of two referees (preferably one should be present employer), should reach the County Planning Officer, East Cliff County Offices, Preston, by Monday, 15th October. [5783

CROWN AGENTS FOR THE COLONIES

ARCHITECTURAL ASSISTANT required by the Government of Northern Rhodesia for the Public Works Department, for one tour of 36 months.

Commencing salary according to age and experience, in the scale £510 rising to £865 a year, plus cost of living allowance, at present equal to 16⅔% of salary. Gratuity of £25 for each three months' service on satisfactory completion of contract. Free passages. Liberal leave on full salary. Candidates 23 years or over should be students of the Royal Institute of British Architects or have had four years' practical experience. (Candidates will be accepted at the minimum of the scale from age 21 years if they have passed the Intermediate examination of the Institute.) A knowledge of survey work and modern school practice would be an advantage.

Apply at once by letter, stating age, full names in block letters and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4, Millbank London, S.W.1, quoting M.2775B.A on both letter and envelope. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. [5784

APPOINTMENTS—contd.

GLOUCESTERSHIRE COUNTY COUNCIL

COUNTY ARCHITECT'S DEPARTMENT

APPOINTMENT OF CLERK OF WORKS

APPLICATIONS are invited for the appointment of a CLERK OF WORKS on the Temporary Staff, to supervise the erection of new schools, etc., in Cheltenham, at a salary of £10 per week.

Applications, stating age, experience, present position and salary, together with copies of testimonials or names for reference, to be sent to S. E. URWIN, ESQ., F.R.I.B.A., COUNTY ARCHITECT, SHIRE HALL, GLOUCESTER, not later than TUESDAY, 25th SEPTEMBER, 1951.

GUY H. DAVIS,
Clerk of the County Council.

Shire Hall,
Gloucester.
6/9/1951. [5786

CARDIGANSHIRE COUNTY PLANNING COMMITTEE

APPOINTMENT OF PLANNING ASSISTANT (GRADE VI)

APPLICATIONS are invited for the post of PLANNING ASSISTANT in the County Planning Department at a Salary in accordance with A.P.T. Grade VI (£645-£710).

Applicants should be Members or Associate Members of the T.P.I., preferably with complementary qualifications and should be experienced in the preparation of Development Plans and Planning Surveys and experience in the supervision of staff is essential.

The post is established, pensionable, subject to medical assessment and prescribed conditions. The Council cannot undertake to provide housing accommodation for the person appointed.

Applicants should give particulars of age, education, technical training, qualifications, experience, present salary, present and previous appointments, which, together with the names of two referees, must reach the undersigned not later than noon on SATURDAY, 6th OCTOBER, 1951.

J. E. R. CARSON,
Clerk of the County Council.

Cambrian Chambers,
ABERYSTWYTH. [5787

BOROUGH OF GRANTHAM.

APPOINTMENT OF CHIEF ARCHITECTURAL ASSISTANT.

APPLICATIONS are invited for the above appointment in the department of the Borough Engineer and Surveyor at a salary in accordance with Grade VII A.P.T. (£685-£760) of the National Scheme of Conditions of Service.

Applicants must be Registered Architects and be capable of preparing and supervising schemes of construction—principally housing.

Previous experience with a local authority is desirable and the successful candidate will be required, under the supervision of the Borough Surveyor, to take charge of the planning and execution of the Council's housing programme.

The appointment is subject to the Local Government Superannuation Act, 1937 and the National Scheme of Conditions of Service, and will be terminable by one month's notice on either side.

Housing accommodation will be made available if necessary.

Applications stating age, qualifications, present and past employment and experience, together with the names of three persons to whom reference can be made, should be sent to Trevor J. Livesey, A.M.I.C.E., A.M.I.Struct.E., A.M.I.Mun.E., Borough Engineer and Surveyor, Guildhall, Grantham, to arrive not later than 10 a.m. on Tuesday, 2nd October, 1951.

John F. Guile,
Town Clerk.

Guildhall,
Grantham. [5788

APPOINTMENTS—contd.

METROPOLITAN BOROUGH OF PADDINGTON.

APPOINTMENT OF ASSISTANT DIRECTOR OF HOUSING (TECHNICAL)
(APT 3C) (£900-£1,030).

APPLICATIONS are invited for this appointment within the above grade.

Candidates must (i) be chartered and registered architects with considerable practical administrative experience in all branches of building work; (ii) have had good experience in contemporary design; and (iii) be thoroughly conversant with local authority work. Some town planning experience would be an advantage.

The successful candidate will be directly responsible to the Director of Housing for the technical work of the Housing Department. This work includes the design and supervision of large housing schemes, building work for Council departments, liaison with consultants engaged in connection with Council housing schemes and the direct supervision of the technical staff.

Candidates must furnish information under the following headings, viz.:—

(i) Age; (ii) Qualifications; (iii) Present and previous appointments and dates; (iv) Experience; and (v) Names and addresses of three referees.

Covering envelopes must be endorsed "Appointment A.29" and should reach me by 10 a.m. on 8th October, 1951.

W. H. BENTLEY,
Town Clerk.

Town Hall,
Paddington, W.2.
14th September, 1951.
(A.29.) [5793

THE WAR DEPARTMENT requires DRAUGHTSMEN (Architectural and Mechanical and Electrical Engineering) in many parts of the United Kingdom. Applicants must be British of British parentage and possess the following minimum qualifications: Draughtsmen (Architectural). A recognised training and not less than three years experience in an architect's office. Draughtsmen (Mechanical and Electrical Engineering). A technical standard of not less than Ordinary National Certificate with good knowledge and experience of Mechanical and/or Electrical Engineering. Salary in each case (Provincial Rate): £320 p.a. (at age 21) rising to £545 p.a. Written applications indicating the vacancy applied for and any preference for location should be sent to the Westminster Employment Exchange, Chadwick Street, London, S.W.1, quoting orders nos. 5832/3. [5796

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Candidates should be between 35 and 45 and A.R.I.B.A. The successful candidate will be required to organise and administer a large Educational programme and he should have considerable experience in contemporary design, planning and administration of the erection of all types of schools, and school boarding accommodation. He should be well versed in standards of accommodation, modern equipment, and school furniture design.

Intending candidates should apply in writing to the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith St., S.W.1, giving brief details of their age, qualifications and experience. They should mention this paper and quote the reference number (27301/47). [5795

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Drawings, Specification and Conditions of Contract may be seen at the Borough Surveyor's Office.

The Bills will be despatched to applicants on 16th October, 1951, and tenders in the envelope provided are to be delivered to the undersigned not later than 10 a.m. on 17th November, 1951.

Contractors will be required to satisfy the Council that they are in a position to provide the necessary labour to carry out the works.

The acceptance of a tender will be subject to the Standing Orders of the Council with respect to Contracts (a copy of which may be obtained upon application to the Borough Surveyor) and to the execution of a formal contract.

The Corporation do not bind themselves to accept the lowest or any tender, and persons tendering must do so at their own expense.

H. BAILEY CHAPMAN,
Town Clerk.

Town Hall,
Burton-upon-Trent.
22nd September, 1951. [5761

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HUGH B. NISBET,
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[5764

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STANLEY DUMBELL,
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[5779

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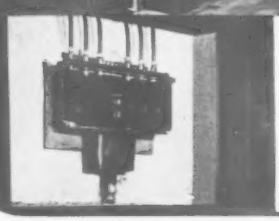

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